

Information on Over-the-Horizon Radar

Part IX

Missile Detection at Altitude

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ABSTRACT
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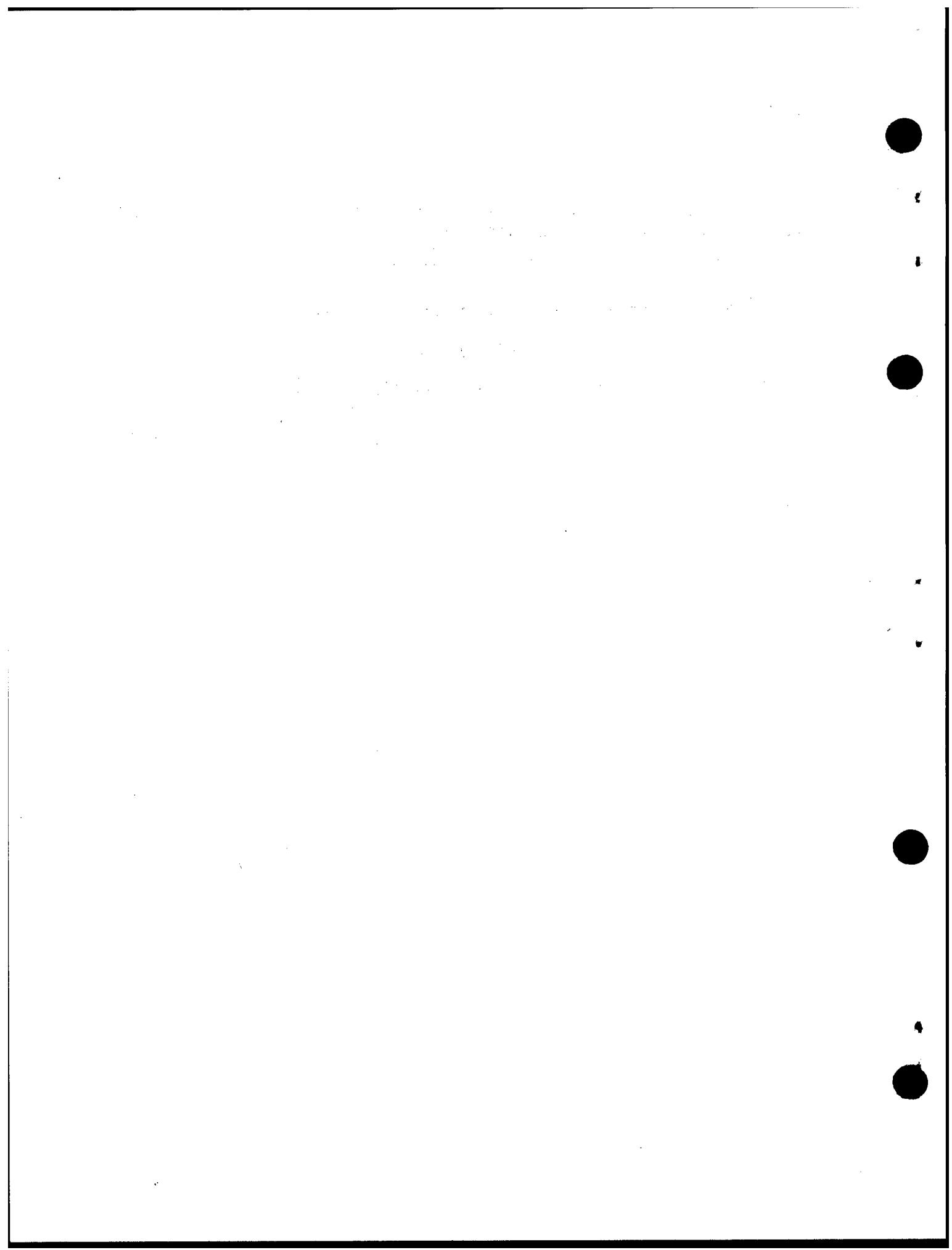
The report gives expected OTH radar performance for a site on Cyprus viewing the area around Lake Balkhash.

PROBLEM STATUS

This is an interim report on a phase of the problem; work is continuing.

AUTHORIZATION

USAF MIPR (30-602) 64-3412 to the
Naval Research Laboratory,
dated 26 March 1964
NRL Problem 53R02-42



MISSILE DETECTION AT ALTITUDE
(Unclassified Title)

INTRODUCTION

The case considered is of a radar on Cyprus viewing missile launches from the Lake Balkhash region. The radar location is taken as 35°N 33°E and the target as 46°N 73°E giving a great circle ground range of 1917 neut. mi. and forward and reverse bearings of 58 and 264 degrees true. ITSA long-range ionospheric data have been used with the prediction methods of ESSA Technical Report ITSA-1 (1) and the radar application of such methods as is described in an NRL report (2). The operating period of 1968-1970 with an estimated average sunspot number (SSN) of 110 is examined for three months, June, September and December being representative of summer, equinoxes and winter. A frequency complement composed of channels at nominally 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 26, and 30 Mc has been assumed available. Target altitudes considered are 0, 50, 100, and 150 km. The signal absorbing layer has been considered slightly below 100 km. After some study of the Cyprus sites it was decided to deny launch angles below 2 degrees in the analysis. The controlling noise was taken as that given in CCIR Report 322 except that noise power was not allowed to drop below a threshold set by a median level, $N_m = 148 + 12.6 \ln(fMc/3)$ db, below a watt.

RESULTS

The results are given in the form of diurnal graphs of % Time, S/N, ϕ , and f .

% Time is a measure of radar effective operating time and also it has been called Total Reliability. In effect it is a combined reliability computed from individual reliabilities based upon the fading signal, fluctuating noise and probability of ionospheric support for the better frequencies in the complement. An implicit assumption is that the radar is frequency and launch angle flexible, that existing propagation conditions are known and the radar is properly operated.

S/N is the ratio in db of output signal to noise at the monthly median MUF.

ϕ is the vertical launch angle in degrees for the monthly median MUF path. Except where noted angles below two degrees have been denied.

f is the median MUF for the month given in megacycles per second.

Time is given in local hours at the radar site.

The modes considered are as sketched in Fig. 1, and on the diurnal graphs the mode for the median MUF is indicated. All percent time curves have been computed with the requirement that the output signal-to-noise be 10 db or better. The product, (radiated power over a watt) (antenna gain over a free space isotrope)² (signal processing time over a second) (target radar

area over a square meter) or $PG^2T_0 = 133$ may be broken down as follows:

$P = 200$ kw average or	53 db
G^2	50 db
$T = 20$ sec or	13 db
$\sigma = 50$ sq meters or	17 db
	133 db

For another example the $PG^2T_0 = 113$ can be broken down into:

$P = 50$ kw average or	47 db
G^2	50 db
$T = 0.8$ sec or	-1 db
$\sigma = 50$ sq meters or	17 db
	113 db

If it is desired to designate 13 db as the required output signal-to-noise ratio, the analysis is applicable with 3 db added to PG^2T_0 ; for the two examples given above say make the average powers 400 kw and 100 kw respectively.

Figures 2 through 13 are the diurnal graphs of Total Reliability or Percent Time of effective operation (% Time), output median signal to median noise ratio (S/N) for the median MUF, launch angle (ϕ) in degrees for the median MUF, and frequency (f) in megacycles per second for the median MUF. The median MUF mode is indicated between the % Time and S/N plots. For the most part these curves show a marked decrease in radar capability during midday - except for the higher altitude targets in winter. The effective operating times are summarized in Fig. 14 by daily averages. The $PG^2T_0 = 133$ radar circuit shows daily effective times of near 50% and above. The $PG^2T_0 = 113$ circuit is never effective more than 11% of the time.

The somewhat superior performance indicated for targets at altitude may seem surprising. This altitude superiority is due in part to there being more available modes, that is 1F-, 1F+, 2F- and 2F+, than either 1F or 2F only for the near surface target. If launch angles down to zero degrees had been permitted the near surface target detection capability would be considerably enhanced. This is shown by an example in Fig. 15 as a comparative diurnal plot, and also in Fig. 14 the average for June at 0 km and all launch angles permitted is given in parentheses.

Figure 16 gives composite plots of the median MUF and its launch angle. The more important thing illustrated is that if coverage is desired over the altitude range between 0 and 150 km, two frequencies and launch angles are required an appreciable part of the time. Such operation might be satisfactorily achieved with a single radar by alternating between two frequencies and launch angles every 10 to 20 seconds with near zero switching time required. For the years considered an overall

[REDACTED]

frequency span running from 10 to 30 Mc/s is required. The antenna should be capable of launch angles up to 15 degrees.

The results of the computations for the $PG^2Tu = 133$ radar circuit are tabulated in an Appendix. These tables can provide a more detailed exhibit of the study; preceding the tables some manual computations are provided for illustration.

CONCLUSIONS

The problem that has been considered is that of missile skin tracking at about 1900 naut. mi. The percent time of expected effective operation has been displayed for three radar circuit cases, $PG^2Tu = 133$, 123, and 113 db. The 113-db radar circuit is thought to be comparable to the existing radar installation refitted with 25-db gain antennas; the 133-db case is similar to that for a radar with an AN/FPS-95 capability. The 113-db case promises little effective operating time. A frequency and azimuth sector abbreviated AN/FPS-95, preferably with two transmitters, should provide effective operation more than half of the time.

REFERENCES

1. D. L. Lucas and G. W. Haydon, "Predicting Statistical Performance Indexes for High Frequency Ionospheric Telecommunication Systems," (U), ESSA Technical Report ITSA-1, 1966 UNCLASSIFIED
2. J. M. Headrick, D. L. Lucas and E. N. Zettle, "HF Sky Wave Radar Performance" (U), NRL Report to be published in 1966 [REDACTED]

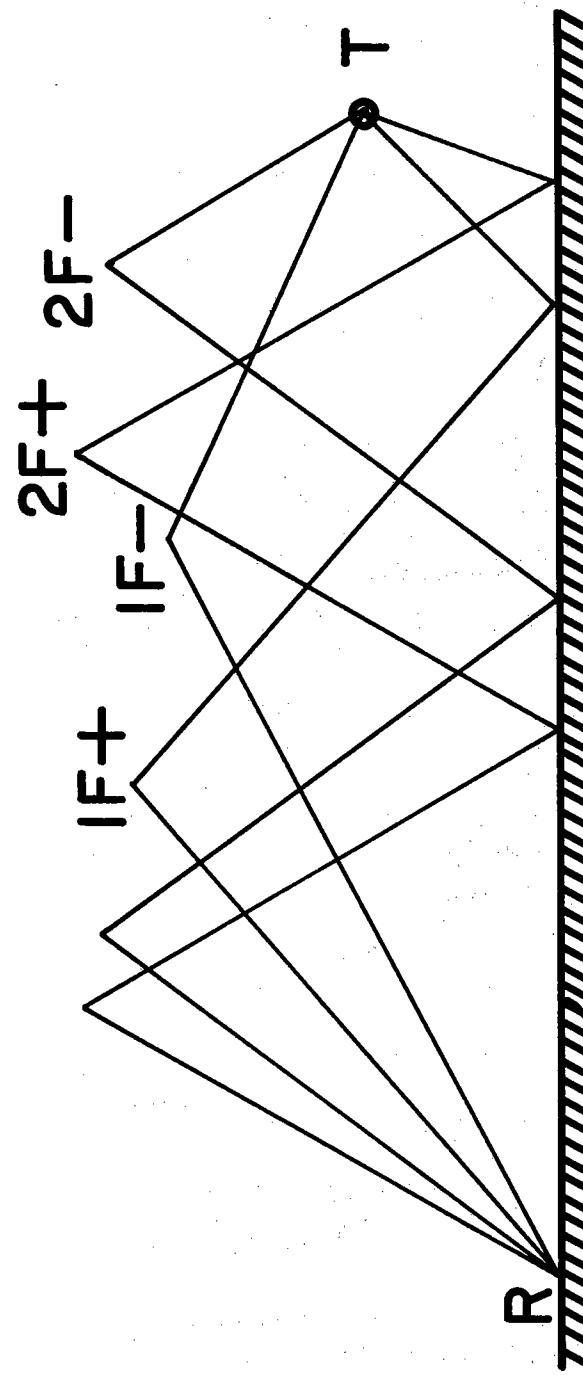


Fig. 1 - The transmission modes considered for targets at altitudes greater than zero are sketched for F-layer reflection

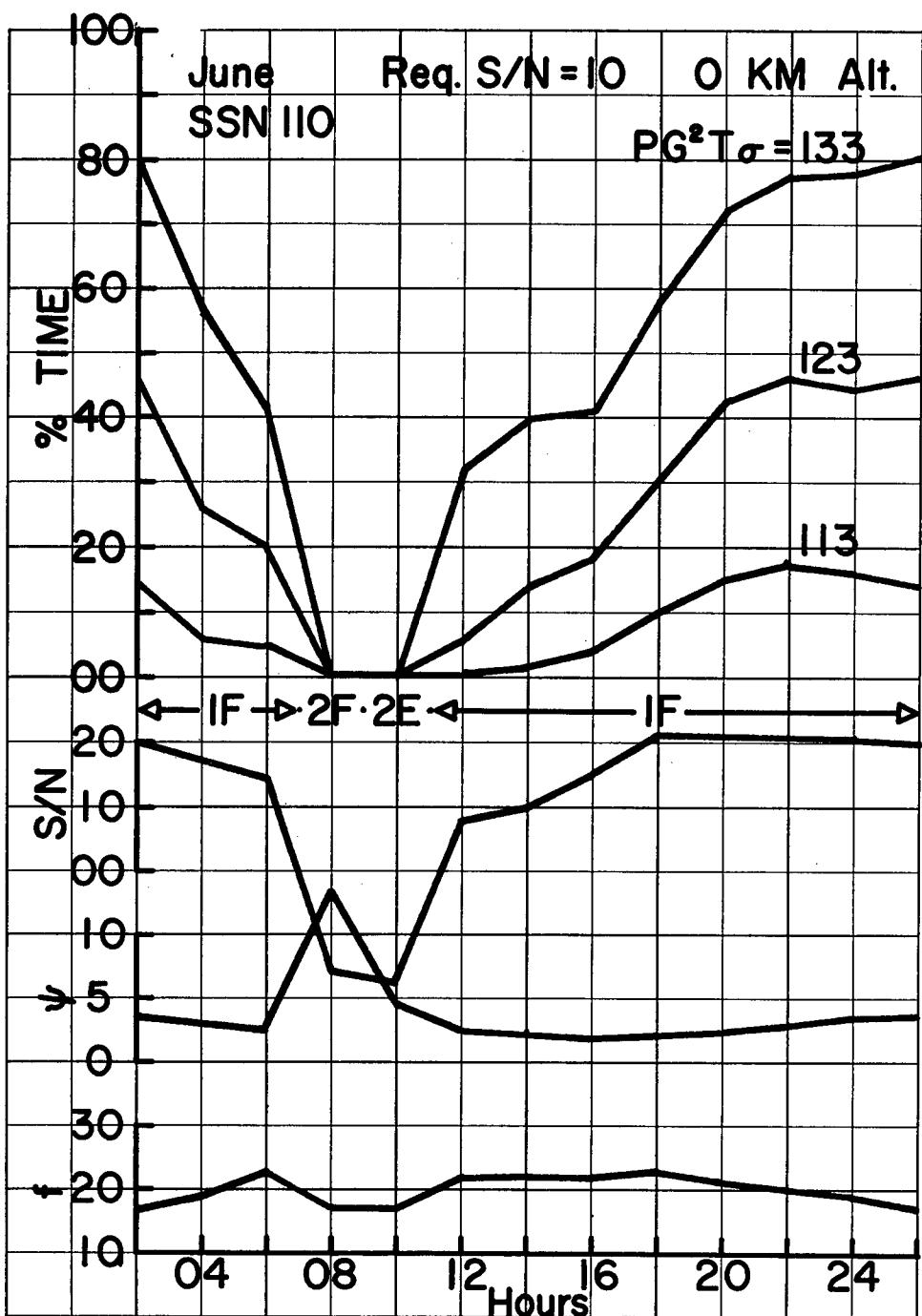


Fig. 2 - Percent time of effective operations for three values of $PG^2 T \sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T \sigma = 133$, the vertical launch angle (ϕ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

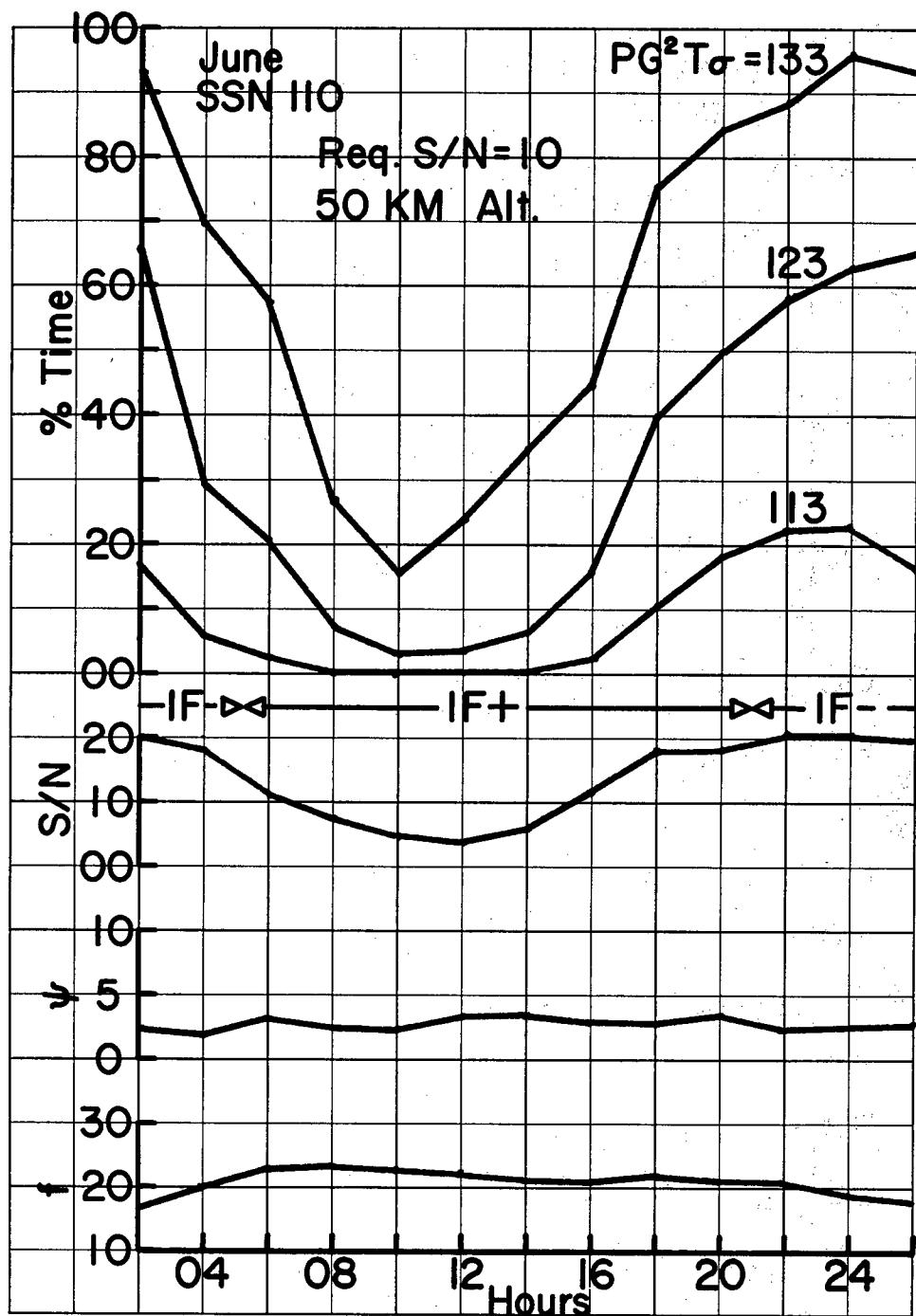


Fig. 3 - Percent time of effective operations for three values of $PG^2 T\sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T\sigma = 133$, the vertical launch angle (ϕ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

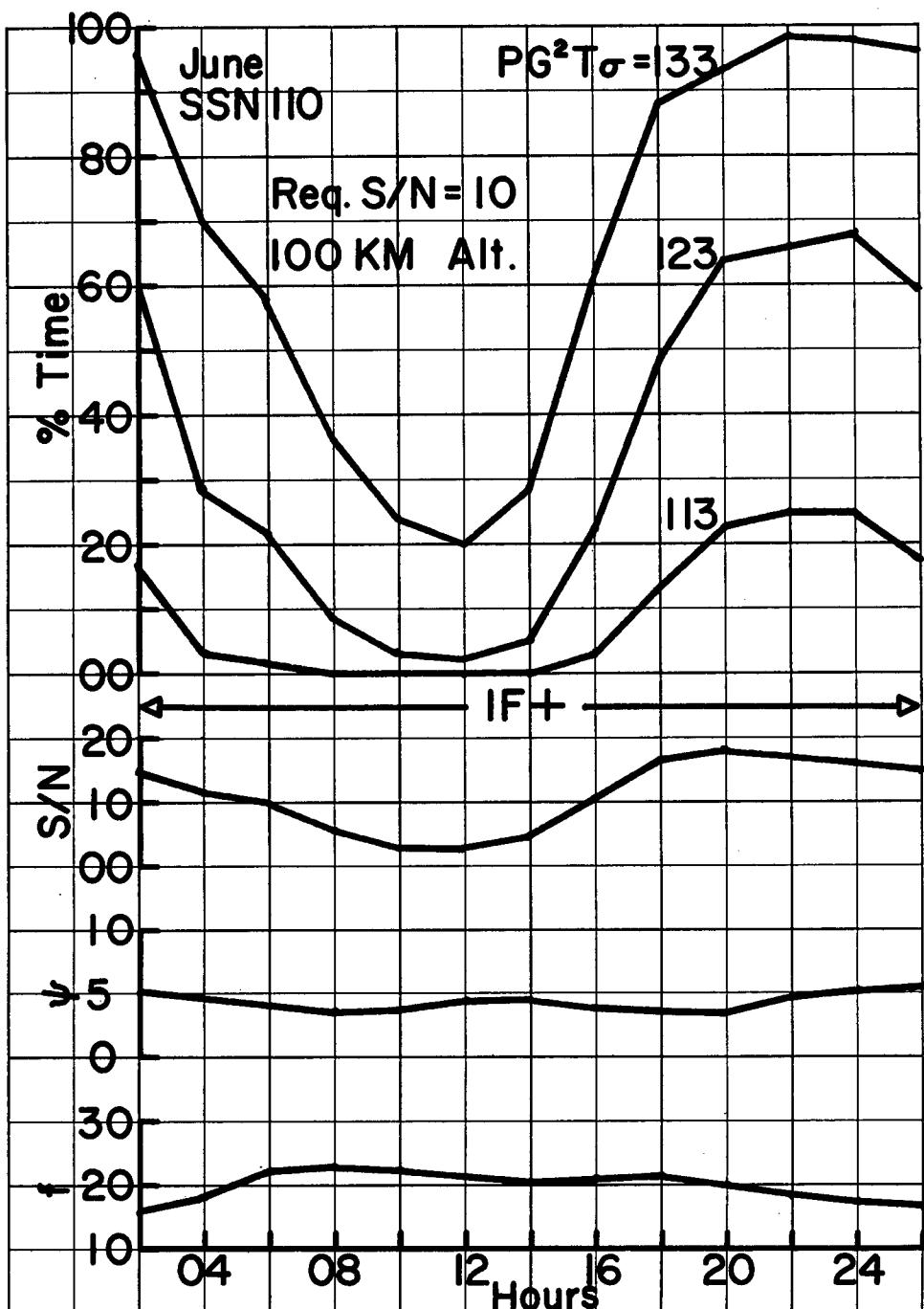


Fig. 4 - Percent time of effective operations for three values of $PG^2 T_\sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T_\sigma = 133$, the vertical launch angle (Φ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

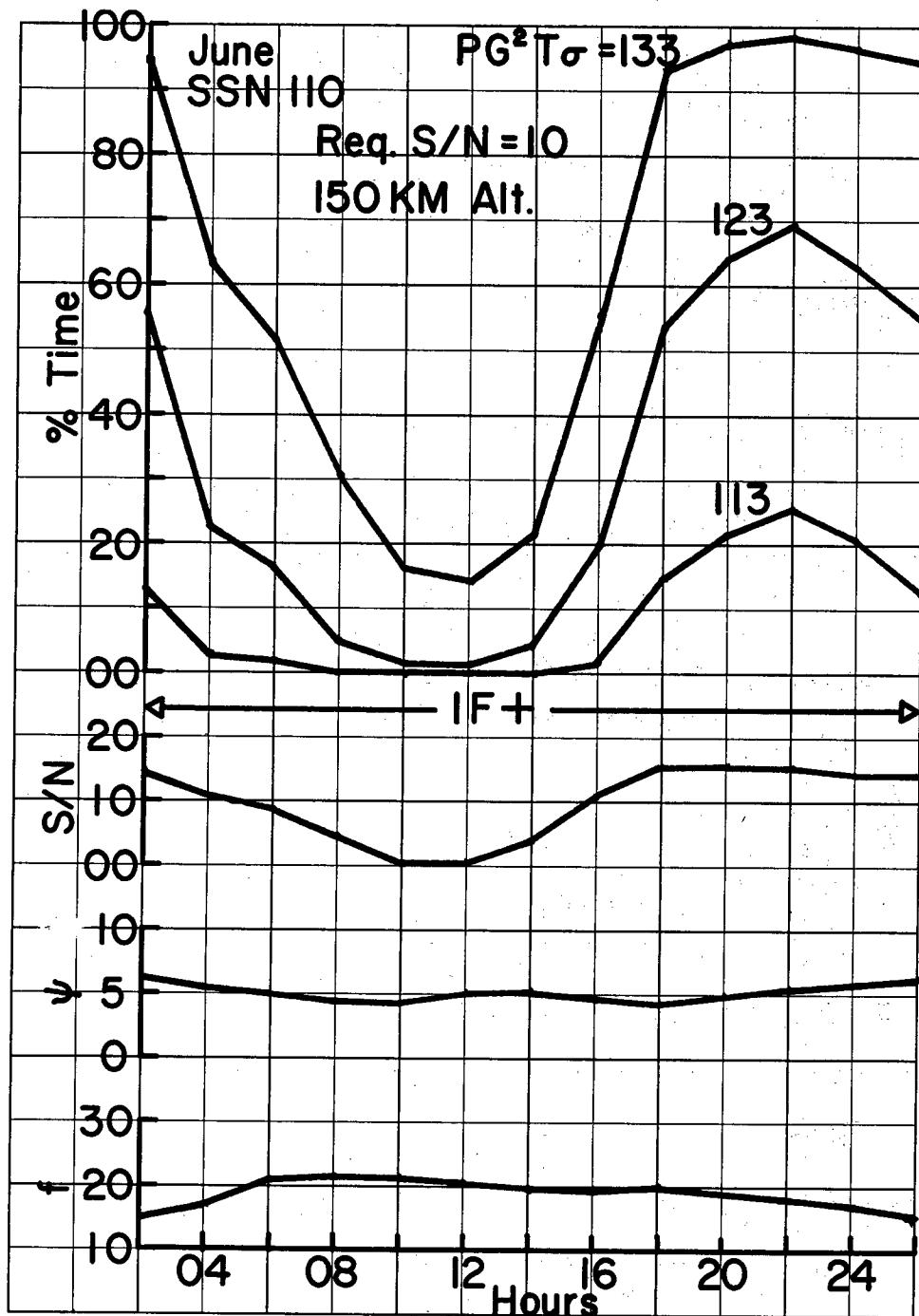


Fig. 5 - Percent time of effective operations for three values of $PG^2 T\sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T\sigma = 133$, the vertical launch angle (φ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

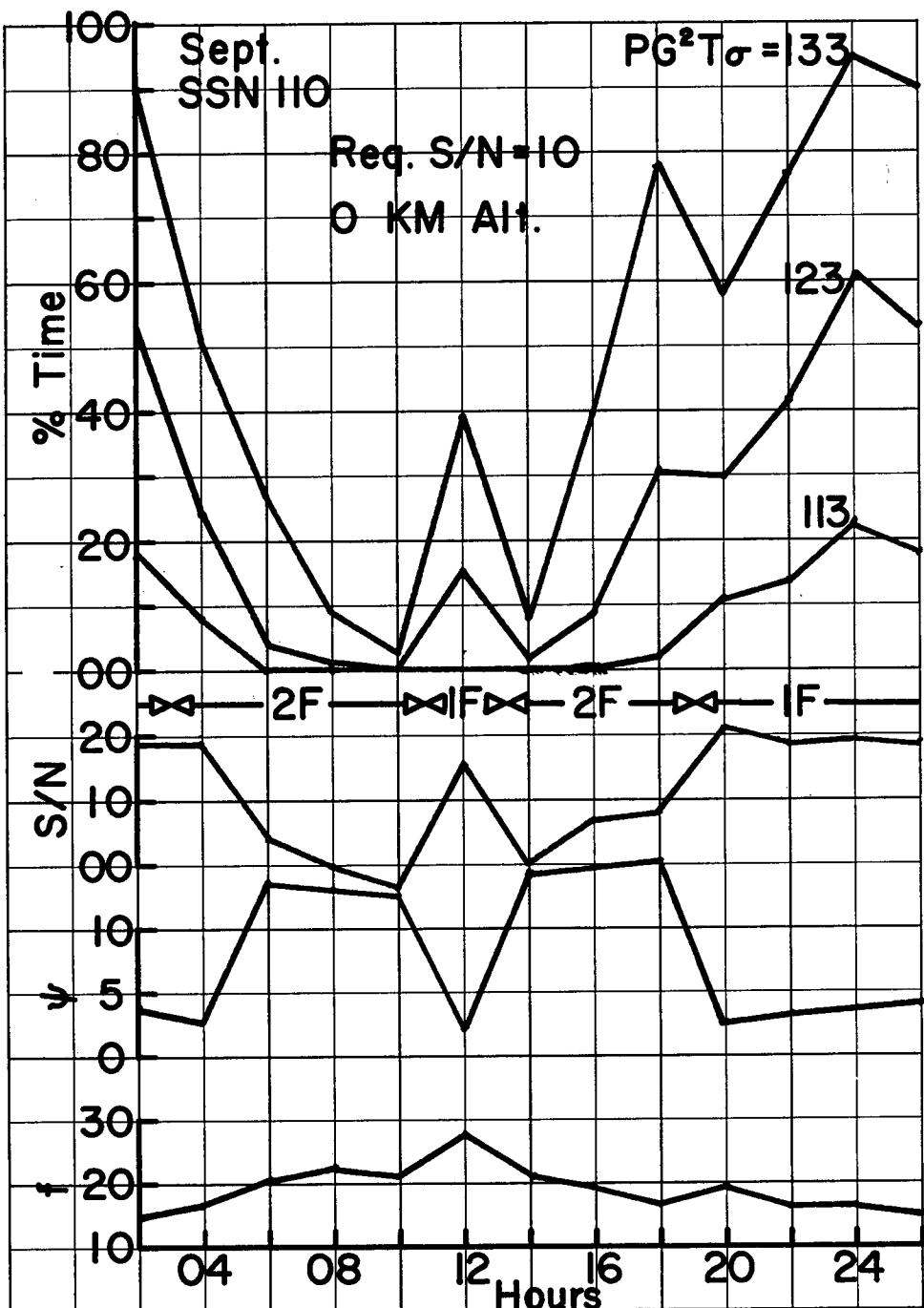


Fig. 6 - Percent time of effective operations for three values of $PG^2 T\sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T\sigma = 133$, the vertical launch angle (ϕ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

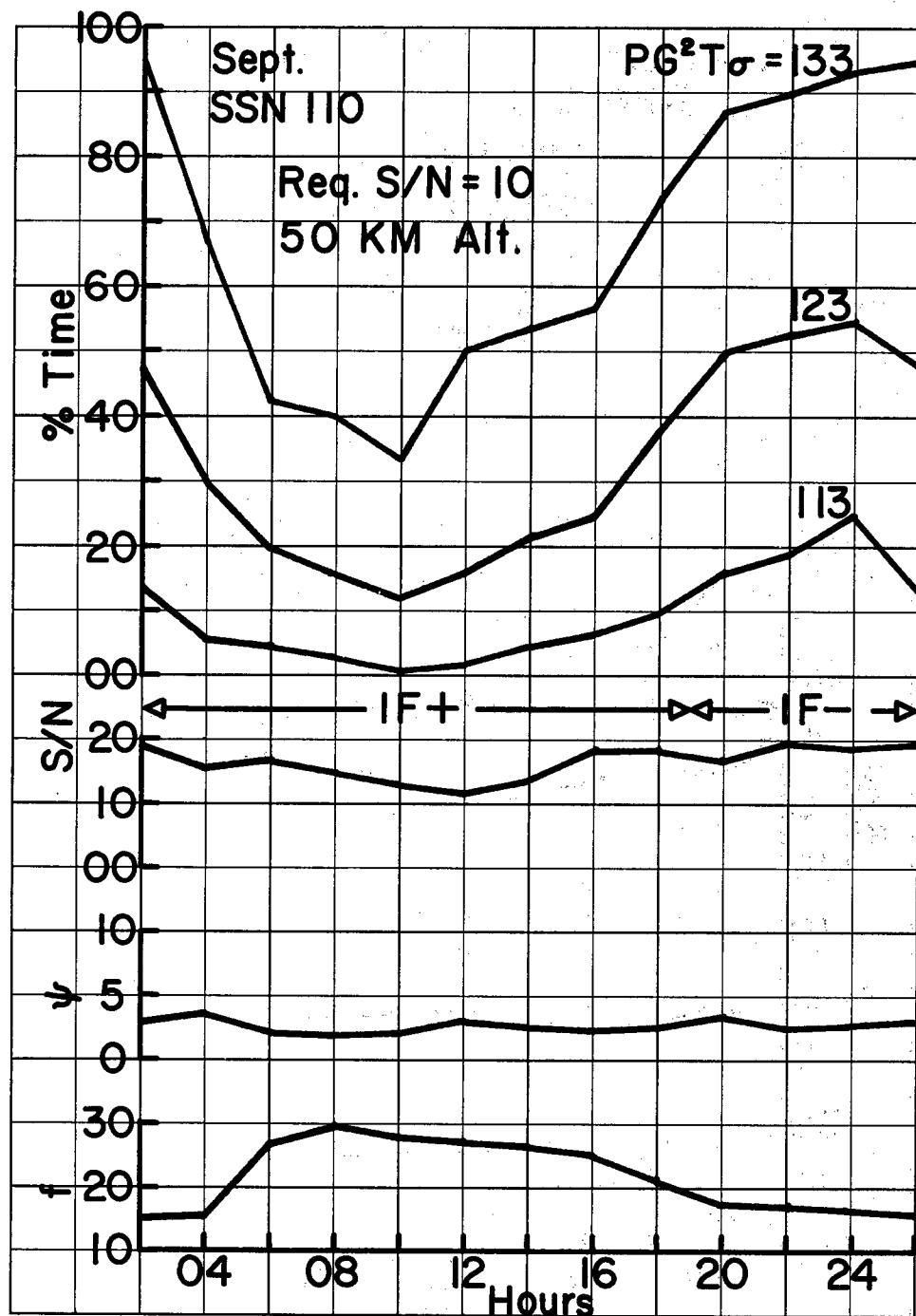


Fig. 7 - Percent time of effective operations for three values of $PG^2 T \sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T \sigma = 133$, the vertical launch angle (ϕ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

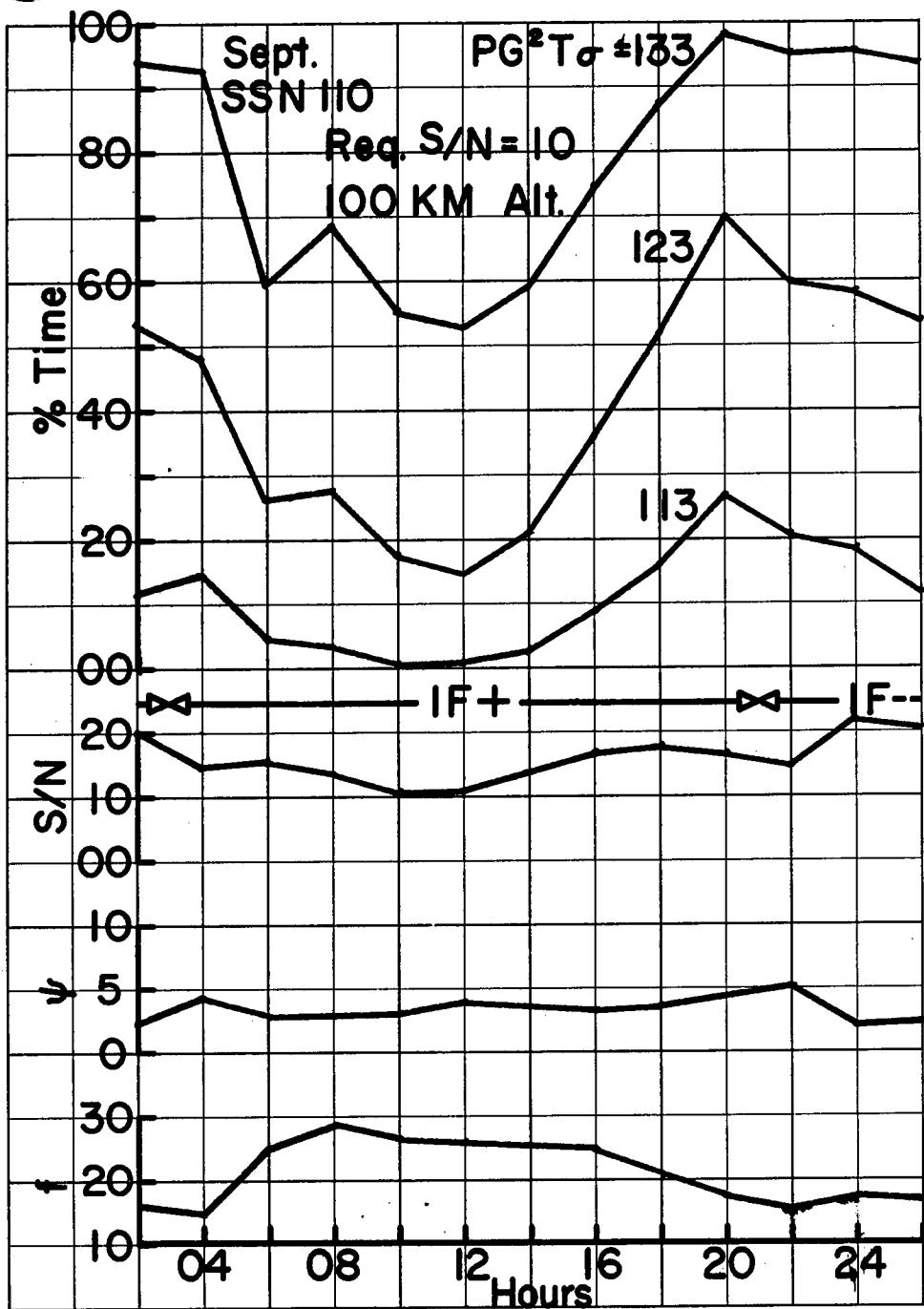


Fig. 8 - Percent time of effective operations for three values of $PG^2 T\sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T\sigma = 133$, the vertical launch angle (ϕ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

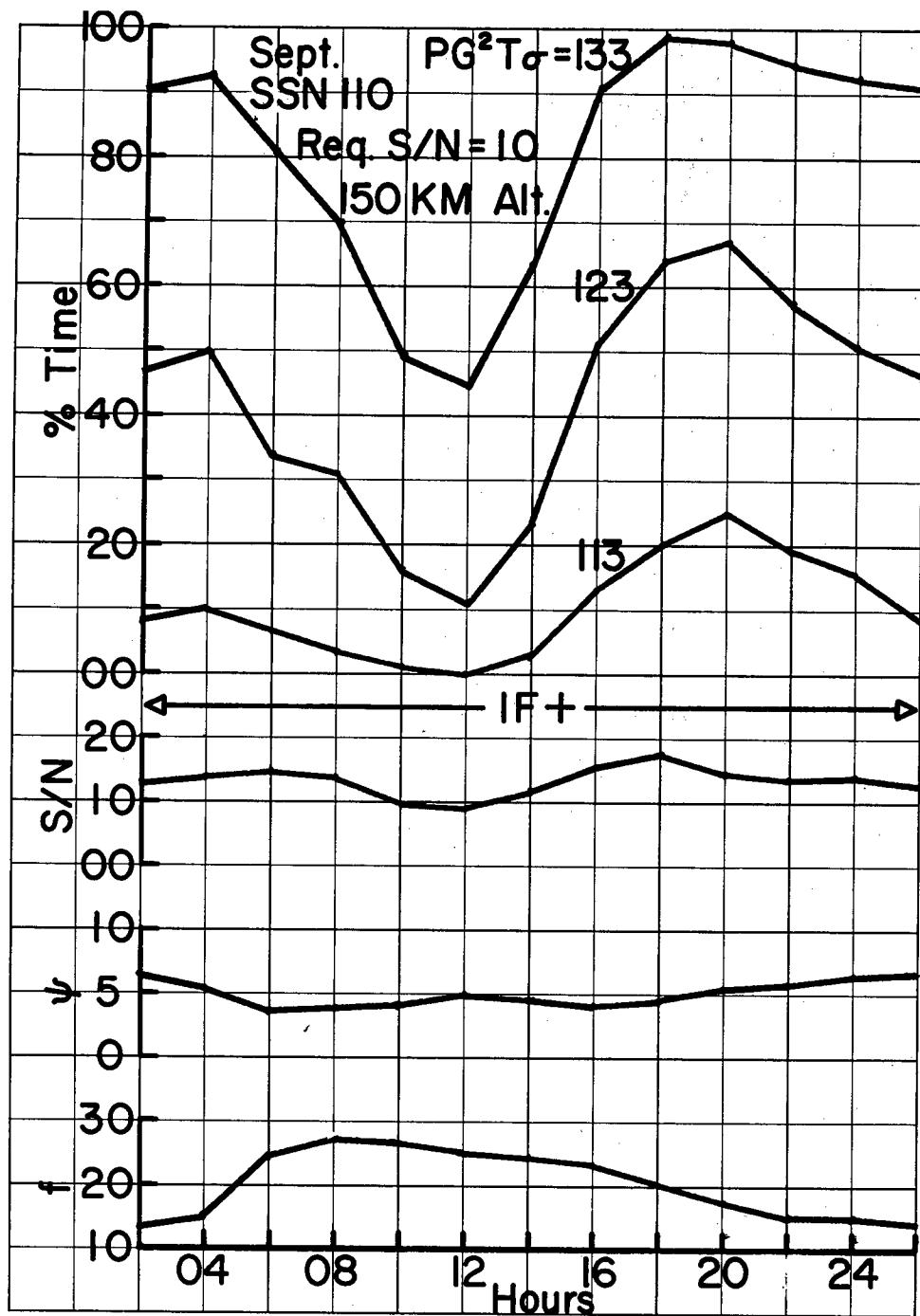


Fig. 9 - Percent time of effective operations for three values of $PG^2 T\sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T\sigma = 133$, the vertical launch angle (φ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

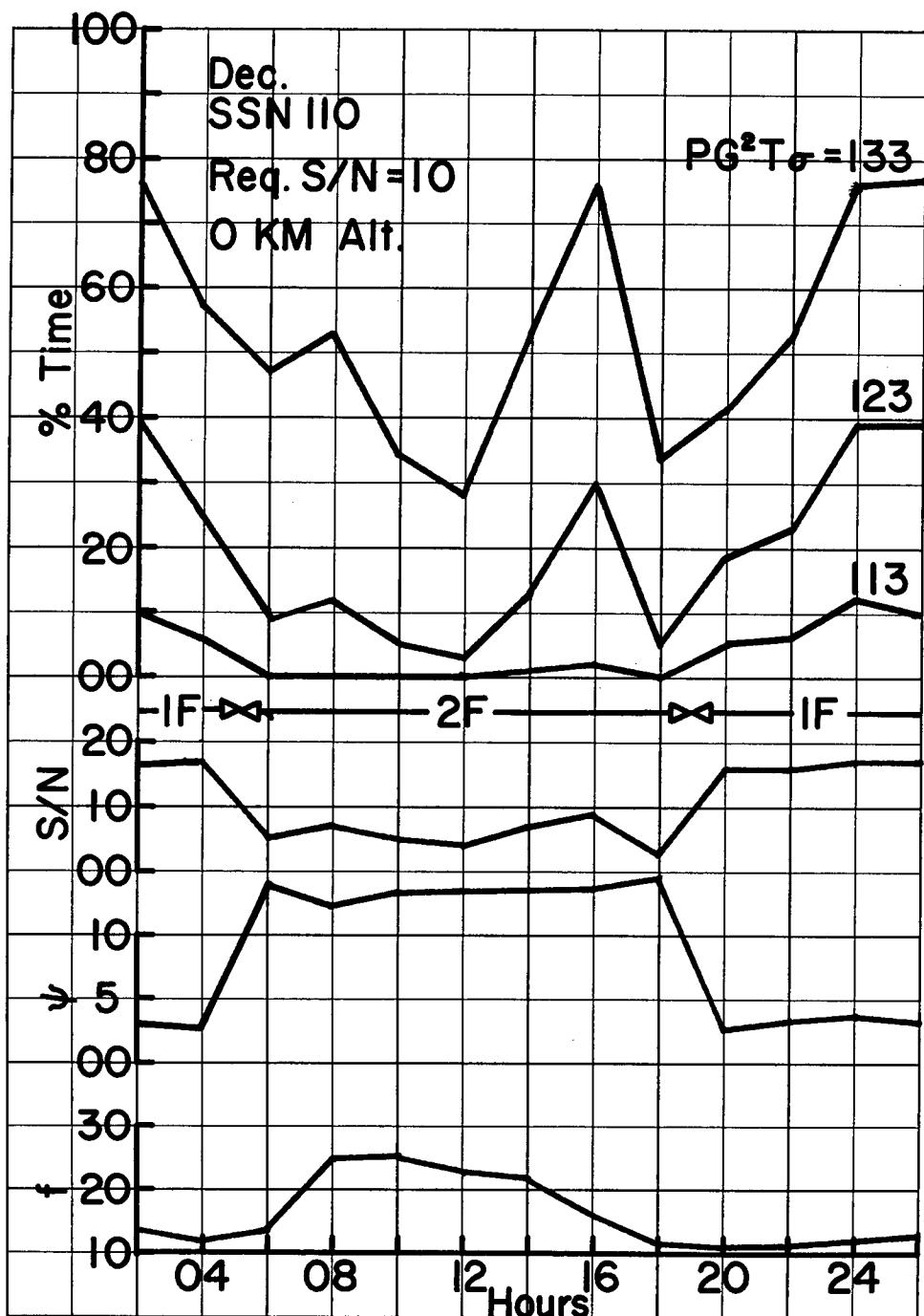


Fig. 10 - Percent time of effective operations for three values of $PG^2 T_\sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T_\sigma = 133$, the vertical launch angle (ϕ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

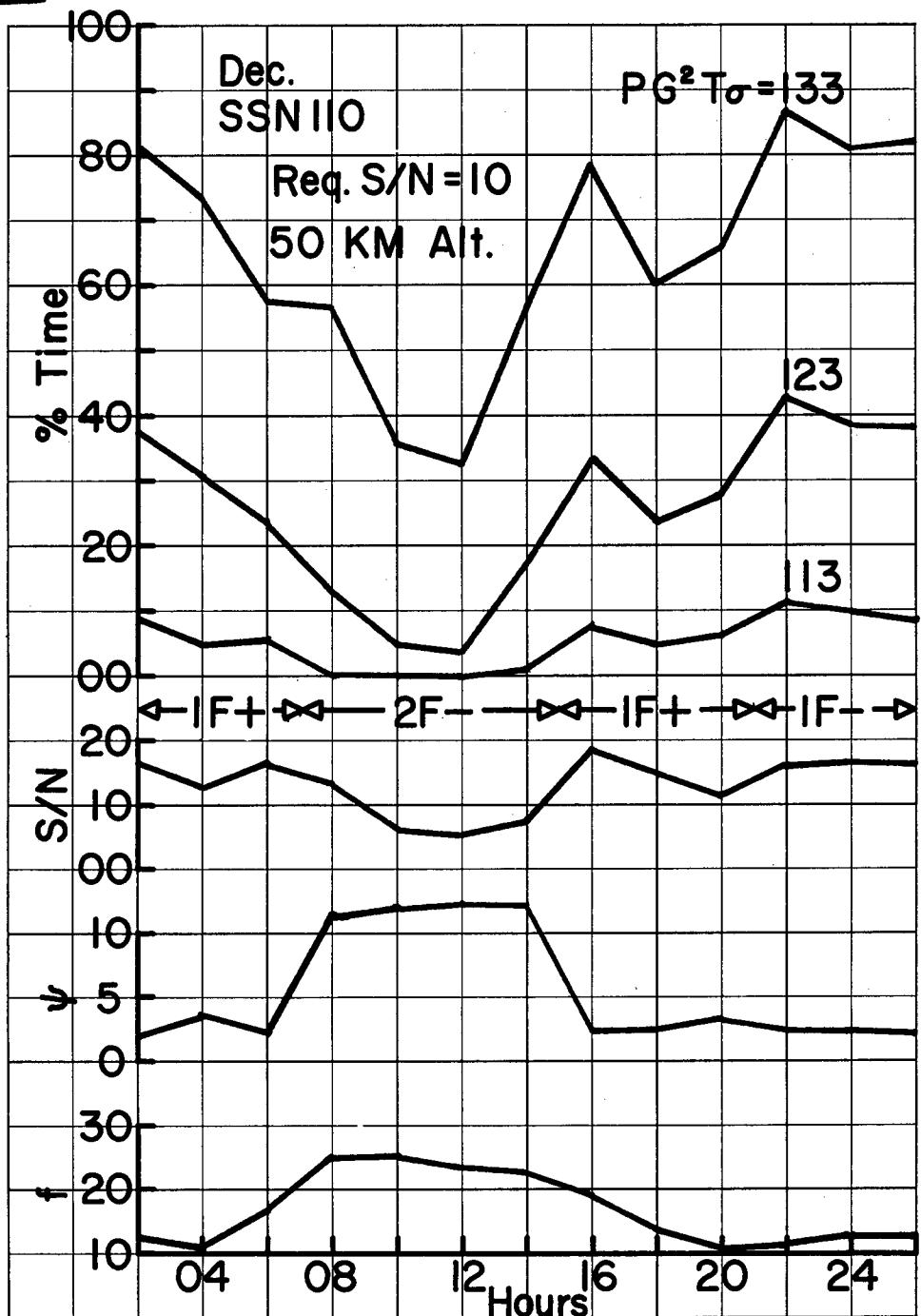


Fig. 11 - Percent time of effective operations for three values of $PG^2 T\sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T\sigma = 133$, the vertical launch angle (φ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

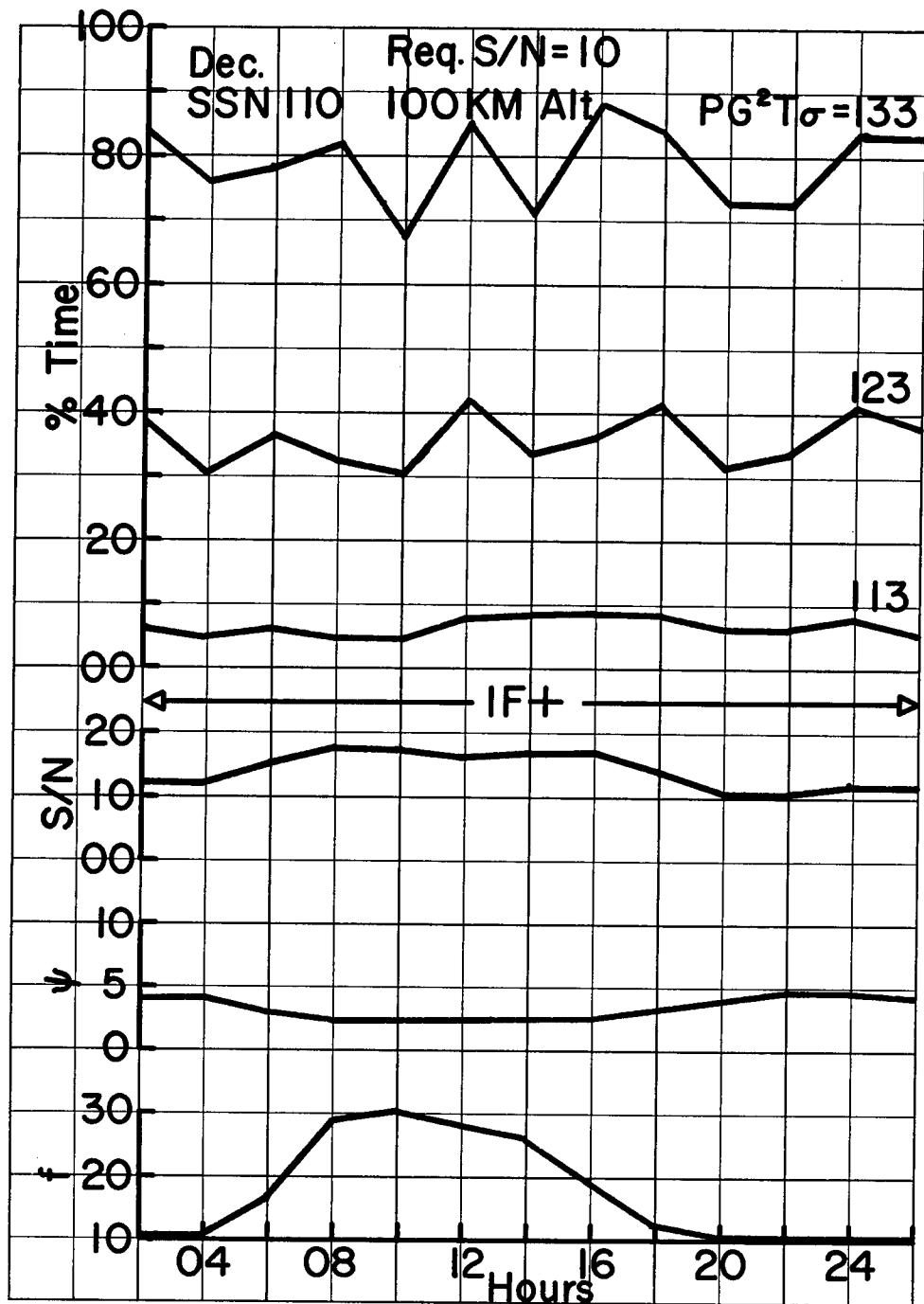


Fig. 12 - Percent time of effective operations for three values of $PG^2 T\sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T\sigma = 133$, the vertical launch angle (φ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

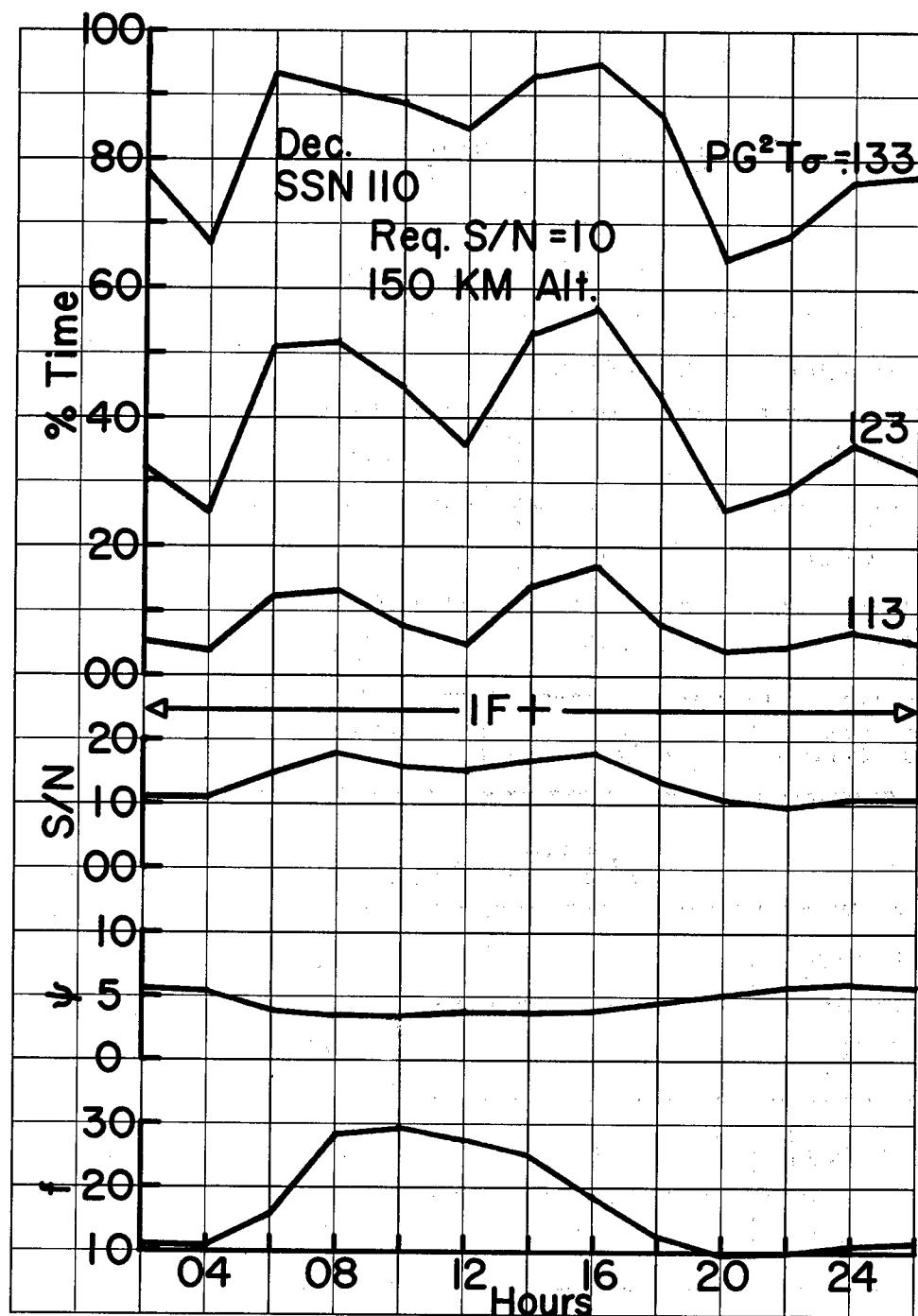


Fig. 13 - Percent time of effective operations for three values of $PG^2 T\sigma$, the median MUF (f) for the designated month in Mc/s, the signal-to-noise ratio (S/N) at the median MUF in db for $PG^2 T\sigma = 133$, the vertical launch angle (φ) in degrees for the median MUF path, and the transmission mode for the median MUF path are given versus local hour of day at the radar site.

Percent Time in Day

$$PG^2 T_{\sigma} = 133$$

Target Alt.	June	Sept.	Dec
0 KM	48 (72)*	48	52
50 KM	59	65	64
100 KM	64	78	79
150 KM	61	80	82

$$PG^2 T_{\sigma} = 113$$

0 KM	7	6	4
50 KM	8	9	5
100 KM	9	11	7
150 KM	9	10	9

* All launch angles permitted.

Fig. 14 - Effective operating time is given by daily average

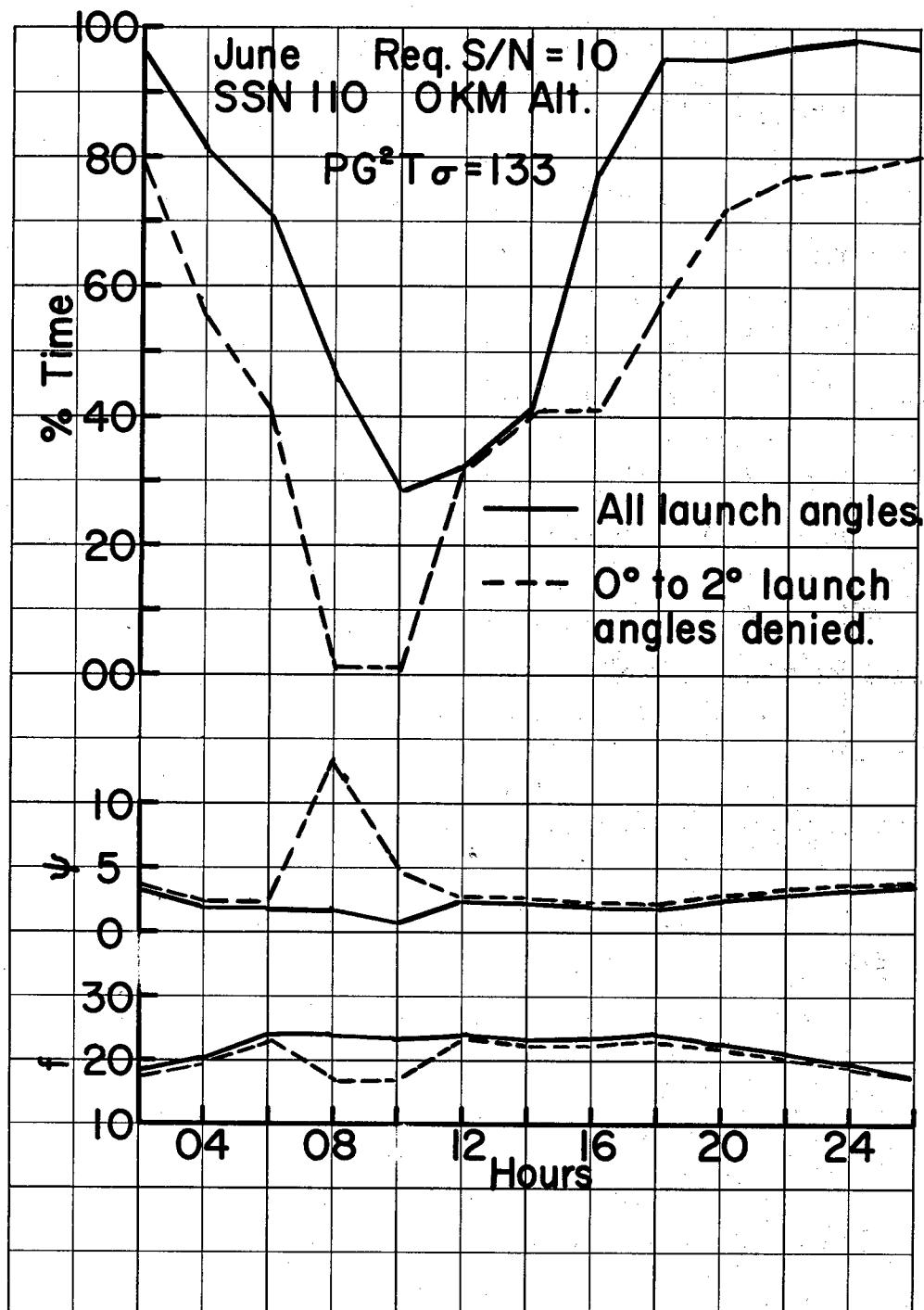


Fig. 15 - A comparison between the case where all launch angles are permitted and where the first two degrees are denied

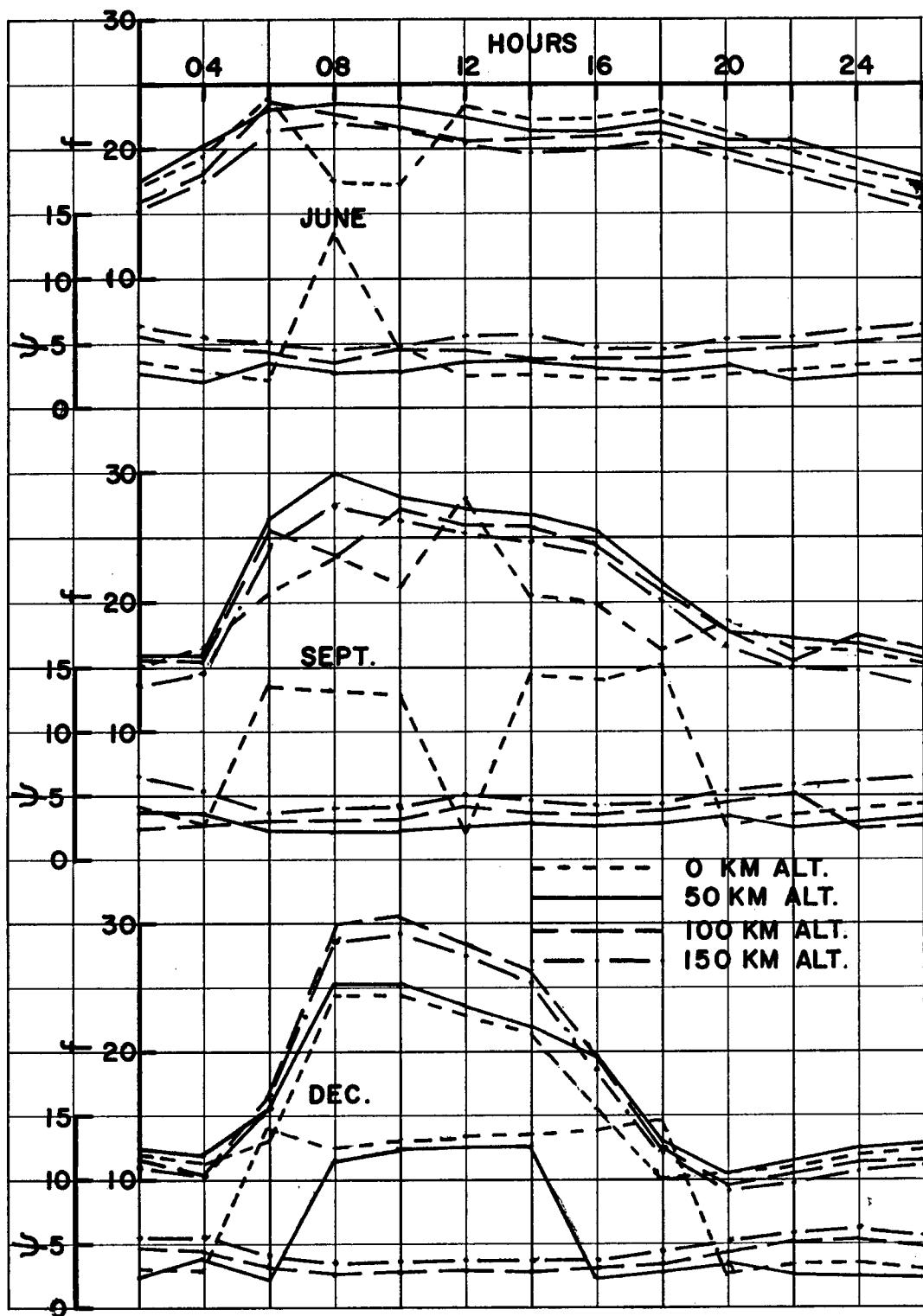


Fig. 16 - The median MUF and its launch angle are shown as combined plots for the altitudes considered

APPENDIX

Prediction Explanation and Set of Tables

The problem brief will be stated. The predictions were computed for June, September, and December, sunspot number 110 using the following parameters:

- a. Height of target - (0, 50, 100, and 150 km)
- b. Gain of antenna - (25 db)
- c. Target radar area (SIGMA) - (1000 sq. meters)
This area was a computational convenience to go with the noise tabulation which was in power in a 1-cps band. The specified parameter in fact is the (radar area) (integration time) product which would be 1000 m²sec.
- d. 3 Mc/s man-made noise - (-148 dbw)
- e. Required signal-to-noise ratio - (10 db)
- f. Power - (200 kw)
- g. Minimum acceptable angle of takeoff and arrival - (2 degrees)

A description of the body of the print-out follows:

1. MUF: Monthly median Maximum Usable Frequency
2. MODE: The mode contributing most to the overall probability that at least one sky-wave path exists
3. ANGLE: The average takeoff and arrival angle associated with the above mode
4. C.PROB.: The overall probability that at least one mode is present to produce the quasi-minimum loss for the circuit
5. NOISE: The predominant noise (atmospheric, man-made or cosmic) (db < 1 watt in a 1-cps bandwidth)
6. FS.LOSS: The free space loss between isotropic radiators (two ways)
7. P.LOSS: The propagation losses two ways (ionospheric quasi-minimum and ground losses)
8. S/N.DB: The received signal power in the occupied bandwidth relative to the noise in a 1-cps bandwidth
9. S/N.PROB: The probability that the available signal-to-noise exceeds the required signal-to-noise considering only the fluctuation of the signal and noise (ionospheric probability of support not included)
10. T.REL.: The total combined reliability of the frequency complement

One set of computation results is shown in the following tables, those for $PG^2Tu = 133$ db and a required output signal-to-noise ratio of 10 db.

An approximate manual solution for one hour will be given. The relation used is

$$\left[\frac{s}{n} \right] = \frac{PG^2 TU \lambda^2}{NL(4\pi)^3 R^4}$$

The computations were for $\sigma = 1000$ and $T = 1$, however any $\sigma T = 1000$ is valid, and the examples in the body of the report were taken as $\sigma = 50 \text{ m}^2$ and $T = 20 \text{ sec}$, since 50 m^2 is an appropriate estimate of the missile skin radar area and 20 sec is about all the signal processing time that can be effective. Since the free space spreading loss as given in the tables is $\text{FS.LOSS} = (4\pi R/\lambda)^4$, that is, the two-way spreading loss between two isotropes, the radar equation will be rearranged:

$$\left[\frac{s}{n} \right] = \frac{PG^2 TU}{NL} \left(\frac{\lambda}{4\pi R} \right)^4 \frac{4\pi}{\lambda^2}$$

or using db

$$\left[\frac{s}{n} \right]_{\text{db}} = 10 \log P + 20 \log G + 10 \log \sigma T - 10 \log N - 10 \log L - \text{FS.LOSS} - 10 \log \frac{\lambda^2}{4\pi}$$

The specified parameters set

$$\begin{aligned} 10 \log P &= 53 \\ 20 \log G &= 50 \quad \text{and} \\ 10 \log \sigma T &= 30 \end{aligned}$$

Consider the case for June, 12 hours, and 0 km altitude at the MUF.

$$-10 \log N = 172 \text{ from the table}$$

As a matter of interest this happened to be the median noise level set by specifying a rural noise threshold.

$$10 \log L = 13 + 9$$

The 13 is taken from the table and is the quasi-minimum loss plus ground reflection loss where appropriate. The 9 is the excess system loss which though not printed out in the table was used in the computations. This excess system loss is the factor that randomly varies giving the fluctuating signal description. Its median value for the problem here under study remained approximately 9 db at all times.

FS.LOSS = 261 from the table

$$10 \log \frac{\lambda^2}{4\pi} \approx 12 \text{ at } 22.2 \text{ Mc/s}$$

So:

$$\begin{aligned} \left[\frac{s}{n} \right]_{\text{db}} &= 53 + 50 + 30 + 172 - 13 - 9 - 261 - 12 \\ &= 10 \text{ db} \end{aligned}$$

This is the value that the computer printed out in the table.

An example of determining Total Reliability (T.REL) or % Time of effectiveness will be given for the same time block that the above output signal-to-noise ratio was computed. By inspection the highest best frequency of the complement is 21 Mc/s, and the reliability at that frequency can be computed

$$\begin{aligned} R_1 &= (\text{C PROB}) (\text{S/N PROB}) \\ &= (0.63)(0.44) = 0.28 \end{aligned}$$

Another reliability is computed selecting the best case from frequencies more than 15% above that of R_1 . This turns out to be at 26 Mc/s.

$$R_2 = (0.12)(0.73) = 0.09$$

Similarly a reliability is computed for the best case among frequencies at least 15% below that of R_1 . This is for 17 Mc/s and gives

$$R_3 = (0.92)(0.19) = 0.18$$

It has been assumed that these reliabilities from frequencies 15% or more apart are independent thus

$$\begin{aligned} \text{T.REL} &= R_1 + R_2 + R_3 - R_1R_2 - R_2R_3 - R_3R_1 + R_1R_2R_3 \\ &= 0.28 + 0.09 + 0.18 - 0.02 - 0.02 - 0.05 + 0.0 \\ &= 0.46 \text{ or } 46\% \end{aligned}$$

This compares with the computer printout of 47%.

1 JUN SSN= 110 26.019
 TRANSMITTER TO 0 KM TARGET AZIMUTHS N.MILES.
 35.00N - 33.00E 46.00N - 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWR=200.00KW 3 MC/S MAN. NOISE = -148 DBW REQ.S/N= 10DB
 OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
2	19.5	1 F	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	1 F	1 F	1 F	-	-	MODE
		30	32	145	125	126	134	149	171	-	26	29	29	-	-	ANGLE
		50	99	99	99	97	88	67	29	-	56	24	5	-	-	C.PROB.
		124	121	128	126	126	127	128	131	-	124	124	124	-	-	DELAY
		170	148	154	158	161	163	165	167	-	170	171	172	-	-	NOISE
		259	226	236	241	246	249	252	255	-	258	260	262	-	-	FS.LOSS
		5	257	80	54	38	29	24	21	-	6	5	4	-	-	P. LOSS
		17	-239	-62	-34	-17	-8	-2	0	-	17	18	19	-	-	S/N..DB
		87	0	0	0	0	3	12	18	-	86	89	92	-	-	S/N..PROB.
														56	=T.REL.	
4	23.9	1 F	2 E	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	1 F	1 F	MODE
		23	30	31	33	36	40	122	129	147	155	155	155	20	20	ANGLE
		50	99	99	99	99	99	90	76	54	34	18	8	35	14	C.PROB.
		123	120	121	121	121	121	126	127	128	129	129	129	123	123	DELAY
		173	148	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
		262	226	235	240	245	249	252	255	257	259	261	262	264	266	FS.LOSS
		9	575	268	155	101	55	43	35	29	25	23	21	7	6	P. LOSS
		15	-557	-248	-134	-79	-34	-22	-13	-6	-2	0	1	17	19	S/N..DB
		78	0	0	0	0	0	0	1	5	11	15	21	85	90	S/N..PROB.
														42	=T.REL.	
6	17.6	2 F	-	2 E	2 E	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	-	-	MODE
		136	-	31	32	33	35	38	44	129	139	139	139	-	-	ANGLE
		50	-	99	99	99	99	99	99	57	37	20	9	-	-	C.PROB.
		127	-	120	121	121	121	121	121	127	127	127	127	-	-	DELAY
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		37	-	402	232	151	106	60	49	40	34	29	26	-	-	P. LOSS
		-15	-	--382	-211	-130	-85	-39	-27	-17	-11	-6	-3	-	-	S/N..DB
		0	-	0	0	0	0	0	0	1	4	8	-	-	S/N..PROB.	
														0	=T.REL.	
8	17.2	2 E	-	2 E	2 E	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	-	-	MODE
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		99	-	99	99	99	99	99	99	99	30	14	5	-	-	C.PROB.
		121	-	120	121	121	121	121	121	121	127	127	127	-	-	DELAY
		169	-	154	158	161	163	165	167	169	170	171	172	-	-	NOISE
		257	-	235	240	245	248	251	255	257	259	260	262	-	-	FS.LOSS
		44	-	471	272	177	125	93	56	45	38	33	30	-	-	P. LOSS
		-21	-	--452	-251	-156	-103	-70	-33	-22	-15	-10	-6	-	-	S/N..DB
		0	-	0	0	0	0	0	0	0	1	4	-	-	S/N..PROB.	
														0	=T.REL.	

UNCLASSIFIED

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30							
10	23.2	-	2	E	2	E	2	E	2	E	2	F	1	F	-	MODE					
		1	F	-	31	32	33	35	37	1	156	24	150	23	-	ANGLE					
		25	-	99	99	99	99	99	99	43	82	9	52	-	C.PROB.						
		50	-	99	99	99	99	99	99	43	82	9	52	-	DELAY						
		123	-	120	121	121	121	121	121	129	123	128	123	-	NOISE						
		172	-	154	158	161	163	165	167	169	170	171	172	-	FS.LOSS						
		262	-	235	240	245	248	252	255	257	258	261	262	-	P. LOSS						
		15	-	453	261	170	120	64	52	41	22	31	16	-	S/N..DB						
		8	--433-240-149	-98	-43	-30	-18	0	-8	7	-	-	-	-	S/N..PROB.						
		45	-	0	0	0	0	0	0	0	15	2	40	-	32 =T.REL.						
12	22.2	1	F	2	E	2	E	2	E	2	F	1	F	2	F	1	F	1	F	-	MODE
		26	30	31	32	34	36	41	142	21	156	20	21	21	-	ANGLE					
		50	99	99	99	99	99	99	62	92	9	63	40	12	-	C.PROB.					
		124	120	120	121	121	121	121	128	123	129	123	123	123	-	DELAY					
		172	148	154	158	161	163	165	167	169	170	171	172	174	-	NOISE					
		261	226	235	240	245	249	252	255	256	259	260	262	264	-	FS.LOSS					
		13	754	351	203	132	66	52	42	21	30	14	12	10	-	P. LOSS					
		10	-736-331-182-111	-45	-31	-20	-1	-7	8	11	14	-	-	-	-	S/N..DB					
		51	0	0	0	0	0	0	19	4	44	60	73	-	-	S/N..PROB.					
14	22.2	47 =T.REL.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	MODE
		1	F	2	E	2	E	2	F	2	F	2	F	2	F	-	ANGLE				
		21	31	32	34	126	117	121	133	152	152	-	-	-	-	-	C.PROB.				
		50	99	99	99	99	98	89	68	37	13	-	-	-	-	-	DELAY				
		123	120	121	121	126	126	126	127	129	129	-	-	-	-	-	NOISE				
		172	148	154	157	159	162	165	167	169	170	-	-	-	-	-	FS.LOSS				
		261	226	235	241	246	249	252	255	257	259	-	-	-	-	-	P. LOSS				
		7	436	203	118	58	45	35	28	24	22	-	-	-	-	-	S/N..DB				
		16	-418-184	-98	-40	-25	-13	-6	-1	0	-	-	-	-	-	-	S/N..PROB.				
		82	0	0	0	0	0	0	5	12	17	-	-	-	-	41 =T.REL.	-	-	-	-	MODE
16	22.9	58 =T.REL.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ANGLE				
		1	F	2	E	2	F	2	F	2	F	2	F	2	F	-	C.PROB.				
		20	33	112	104	105	110	117	128	154	154	-	-	-	-	-	DELAY				
		50	99	99	99	99	99	97	82	48	16	-	-	-	-	-	NOISE				
		123	121	125	125	125	125	126	127	129	129	-	-	-	-	-	FS.LOSS				
		172	146	151	154	158	162	165	167	169	170	-	-	-	-	-	P. LOSS				
		261	226	235	241	246	249	252	255	257	259	-	-	-	-	-	S/N..DB				
		2	139	52	34	25	20	17	15	15	14	-	-	-	-	-	S/N..PROB.				
		21	-122	-36	-17	-7	0	4	6	7	8	-	-	-	-	58 =T.REL.	-	-	-	-	MODE
		95	0	0	0	2	14	30	37	38	44	-	-	-	-	-	ANGLE				

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
18	2.4	1 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	- 1 F	1 F	-	-	MODE	
		26	119	112	113	117	124	133	152	167	-	24	26	-	-	ANGLE
		50	99	99	99	99	99	91	63	25	-	55	27	-	-	C.PROB.
		124	126	125	125	126	126	127	129	130	-	123	124	-	-	DELAY
		171	143	149	153	158	163	165	167	169	-	171	172	-	-	NOISE
		260	227	235	241	246	249	252	255	257	-	260	262	-	-	FS.LOSS
		1	60	33	22	17	15	14	13	13	-	1	1	-	-	P. LOSS
		21	-46	-19	-7	0	5	7	8	8	-	21	22	-	-	S/N..DB
		96	0	0	3	16	32	42	45	43	-	95	97	-	-	S/N..PROB.
														72	=T.REL.	
20	20.0	1 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	1 F	1 F	1 F	-	-	MODE
		30	125	119	121	126	134	148	173	173	24	30	30	-	-	ANGLE
		50	99	99	99	99	94	76	39	6	63	32	8	-	-	C.PROB.
		124	126	126	126	127	128	131	131	123	124	124	-	-	-	DELAY
		171	143	148	154	159	163	165	167	169	170	171	172	-	-	NOISE
		259	227	235	241	246	249	252	255	257	258	260	262	-	-	FS.LOSS
		2	59	32	22	17	15	14	14	13	2	1	1	-	-	P. LOSS
		21	-46	-19	-6	0	5	6	7	8	21	21	22	-	-	S/N..DB
		94	0	0	4	16	35	39	41	43	95	95	97	-	-	S/N..PROB.
														77	=T.REL.	
22	18.4	1 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	1 F	1 F	1 F	-	-	-	MODE
		35	132	128	131	137	148	171	182	26	35	35	-	-	-	ANGLE
		50	99	99	99	98	87	57	13	69	39	10	-	-	-	C.PROB.
		124	127	126	127	127	128	131	132	124	124	124	-	-	-	DELAY
		170	148	152	156	161	163	165	167	169	170	171	-	-	-	NOISE
		258	227	235	241	246	249	253	255	256	258	260	-	-	-	FS.LOSS
		2	57	32	22	17	15	15	14	2	2	1	-	-	-	P. LOSS
		21	-40	-15	-4	2	4	5	6	20	21	21	-	-	-	S/N..DB
		94	0	0	7	22	32	35	38	93	95	95	-	-	-	S/N..PROB.
														78	=T.REL.	
24	17.2	1 F	2 F	2 F	2 F	2 F	2 F	2 F	1 F	1 F	1 F	1 F	-	-	-	MODE
		37	134	130	134	142	158	185	23	35	37	-	-	-	-	ANGLE
		50	99	99	99	93	72	32	75	52	17	-	-	-	-	C.PROB.
		124	127	127	127	128	129	132	123	124	124	-	-	-	-	DELAY
		169	148	154	158	161	163	165	167	169	170	-	-	-	-	NOISE
		257	227	236	241	246	250	253	254	256	258	-	-	-	-	FS.LOSS
		2	57	32	22	18	16	15	3	2	2	-	-	-	-	P. LOSS
		20	-40	-13	-2	2	4	5	19	20	21	-	-	-	-	S/N..DB
		93	0	1	11	23	30	34	92	93	95	-	-	-	-	S/N..PROB.
														80	=T.REL.	

6 JUN SSN= 110 26.019
 TRANSMITTER TO 50 KM TARGET AZIMUTHS N.MILES
 35.00N - 33.00E 46.00N 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS ANT= 25DB
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWR=200.00KW 3 MC/S MAN. NOISE = -148 DBW REQ.S/N= 10DB

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
2	20.2	1F+	2E-	2E+	2F-	2F+	2F-	1F+	1F+	1F+	1F+	-	-	-	MODE	
		20	24	152	118	118	124	137	21	27	38	38	-	-	ANGLE	
		50	99	99	99	98	90	71	86	70	47	15	-	-	C.PROB.	
		123	120	129	126	126	126	127	123	124	124	124	-	-	DELAY	
		171	148	154	158	161	163	165	167	169	170	171	-	-	NOISE	
		259	226	236	241	246	249	252	254	256	258	260	-	-	FS.LOSS	
		5	255	87	55	38	29	24	11	9	9	8	-	-	P. LOSS	
		18	-237	-69	-35	-18	-8	-2	11	13	14	15	-	-	S/N..DB	
		88	0	0	0	3	12	59	37	74	79	-	-	-	S/N..PROB.	
													70	=T.REL.		
4	23.1	1F+	2E-	2E+	2E-	2E-	2E-	1F+	2F-	1F+	1F+	1F+	1F+	1F+	MODE	
		33	23	23	25	27	30	37	20	132	146	23	32	30	30	ANGLE
		50	99	99	99	99	99	99	96	59	39	68	51	29	10	C.PROB.
		124	120	120	120	120	121	123	127	128	123	124	124	124	124	DELAY
		172	148	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
		262	226	235	241	245	249	252	254	257	259	260	262	264	266	FS.LOSS
		12	565	265	155	102	56	44	22	29	25	13	12	10	8	P. LOSS
		11	-547	-245	-134	-81	-35	-23	0	-6	-2	10	11	14	17	S/N..DB
		60	0	0	0	0	0	0	18	5	11	53	60	73	84	S/N..PROB.
													59	=T.REL.		
6	23.5	1F+	-	2E-	2E-	2E-	2E-	2E-	2F-	2F-	2F-	1F+	1F+	1F+	MODE	
		27	-	23	24	25	27	29	33	116	129	129	25	22	22	ANGLE
		50	-	99	99	99	99	99	99	63	42	25	54	33	12	C.PROB.
		124	-	120	120	120	120	120	121	125	127	127	123	123	123	DELAY
		173	-	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
		262	-	235	241	245	248	252	254	257	259	260	262	264	266	FS.LOSS
		15	-	396	230	151	108	61	50	41	34	30	16	13	10	P. LOSS
		8	--	376	-209	-130	-86	-40	-28	-18	-11	-7	7	11	14	S/N..DB
		41	-	0	0	0	0	0	0	0	1	3	40	57	72	S/N..PROB.
													29	=T.REL.		
8	23.1	1F+	-	2E-	2E-	2E-	2E-	2E-	2F-	1F+	1F+	-	-	-	MODE	
		27	-	23	23	24	26	28	30	34	124	22	27	-	-	ANGLE
		50	-	99	99	99	99	99	99	99	36	68	51	-	-	C.PROB.
		124	-	120	120	120	120	120	120	121	126	123	124	-	-	DELAY
		172	-	154	158	161	163	165	167	169	170	171	172	-	-	NOISE
		262	-	235	241	245	248	252	254	257	259	260	262	-	-	FS.LOSS
		18	-	464	269	177	126	75	57	47	39	21	18	-	-	P. LOSS
		5	--	444	-249	-155	-104	-54	-35	-23	-16	2	5	-	-	S/N..DB
		33	-	0	0	0	0	0	0	0	0	22	32	-	-	S/N..PROB.
													16	=T.REL.		

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
10	22.4	1F+	-	2E-	2E-	2E-	2E-	2E-	2E-	1F+	1F+	1F+	1F+	1F+	MODE	
		35	-	23	24	25	26	28	31	37	31	30	27	27	27	ANGLE
		50	-	99	99	99	99	99	99	99	78	62	45	22	5	C.PROB.
		124	-	120	120	120	120	120	120	121	124	124	124	124	124	DELAY
		172	-	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
		261	-	235	241	245	248	252	255	257	258	260	262	264	266	FSLOSS
		19	-	446	259	170	121	65	53	43	24	21	18	14	12	P. LOSS
		4	--	426	-238	-148	-99	-44	-31	-20	-1	2	5	9	13	S/N.,DB
		27	-	0	0	0	0	0	0	11	22	32	46	67	24	S/N.,PROB.
															T.REL.	
12	21.4	1F+	2E-	2E-	2E-	2E-	2E-	2E-	1F+	1F+	1F+	1F+	1F+	1F+	-	MODE
		36	22	23	24	25	28	31	37	29	27	33	30	30	-	ANGLE
		50	99	99	99	99	99	99	89	75	54	30	7	-	C.PROB.	
		124	120	120	120	120	120	120	121	124	124	124	124	124	-	DELAY
		171	148	154	158	161	163	165	167	169	170	171	172	174	-	NOISE
		260	226	235	241	245	249	252	255	256	258	260	262	264	-	FSLOSS
		16	740	346	201	133	66	54	43	23	19	17	14	12	-	P. LOSS
		6	-722	-327	-181	-111	-46	-32	-21	-0	3	6	9	12	-	S/N.,DB
		38	0	0	0	0	0	0	0	14	26	37	49	63	34	S/N.,PROB.
															T.REL.	
14	21.4	1F+	2E-	2E-	2E-	2E-	2E-	2E-	2F+	2F+	1F+	1F+	1F+	1F+	-	MODE
		30	23	24	26	122	35	112	121	143	143	28	28	28	-	ANGLE
		50	99	99	99	99	99	91	73	45	18	55	31	7	-	C.PROB.
		124	120	120	120	126	121	125	126	128	128	124	124	124	-	DELAY
		171	148	154	157	159	162	165	167	169	170	171	172	174	-	NOISE
		260	226	235	241	246	249	252	254	257	259	260	262	264	-	FSLOSS
		10	429	202	119	59	46	36	29	24	22	10	9	8	-	P. LOSS
		12	-411	-182	-99	-40	-25	-14	-7	-1	0	12	14	16	-	S/N.,DB
		66	0	0	0	0	0	0	4	12	17	65	75	82	44	S/N.,PROB.
															T.REL.	
16	22.1	1F+	2E-	2F-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	1F+	1F+	-	MODE
		29	25	107	97	98	101	107	117	137	146	23	29	29	-	ANGLE
		50	99	99	99	99	99	98	87	57	23	65	37	8	-	C.PROB.
		124	120	125	124	124	125	126	127	128	123	124	124	124	-	DELAY
		172	146	151	154	158	162	165	167	169	170	171	172	174	-	NOISE
		261	226	235	241	245	249	252	254	257	259	260	262	264	-	FSLOSS
		5	139	53	35	25	20	17	15	14	14	5	5	4	-	P. LOSS
		18	-123	-37	-17	-7	0	4	7	8	8	18	18	20	-	S/N.,DB
		88	0	0	0	2	14	30	40	42	44	89	90	93	75	S/N.,PROB.
															T.REL.	

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
18	20.6	1F+	2F-	1F+	1F+	1F+	-	-	MODE							
		35	113	105	106	109	115	124	139	158	26	35	35	-	-	ANGLE
		50	99	99	99	99	99	94	70	32	74	44	18	-	-	C.PROB.
		124	125	125	125	125	126	127	129	124	124	124	-	-	-	DELAY
		171	143	149	153	158	163	165	167	169	170	171	172	-	-	NOISE
		260	226	235	241	245	249	252	255	257	258	260	262	-	-	FS.LOSS
		4	61	33	22	17	15	13	13	13	4	4	4	-	-	P. LOSS
		18	-49	-19	-7	0	6	7	8	9	19	18	19	-	-	S/N.,DB
		89	0	0	3	16	36	42	45	46	91	89	92	-	-	S/N.,PROB.
														85	-T.REL.	
20	20.7	1F-	2F-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	1F-	1F-	-	-	MODE	
		21	119	112	114	118	125	137	165	26	36	21	21	-	-	ANGLE
		50	99	99	99	99	95	80	49	78	54	45	16	-	-	C.PROB.
		123	126	125	125	126	126	127	130	124	124	123	123	-	-	DELAY
		171	143	148	154	159	163	165	167	169	170	171	172	-	-	NOISE
		260	227	235	241	246	249	252	255	257	258	260	262	-	-	FS.LOSS
		2	60	33	22	17	15	14	14	4	5	1	1	-	-	P. LOSS
		21	-48	-20	-6	1	5	7	7	18	18	21	22	-	-	S/N.,DB
		95	0	0	4	19	35	42	41	88	89	95	97	-	-	S/N.,PROB.
														89	-T.REL.	
22	19.1	1F-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	1F-	1F-	1F-	-	-	MODE	
		26	126	120	123	129	139	22	28	37	25	26	-	-	-	ANGLE
		50	99	99	99	99	90	96	84	62	51	18	-	-	-	C.PROB.
		124	126	126	126	127	127	123	124	124	123	124	-	-	-	DELAY
		170	148	152	156	161	163	165	167	169	170	171	-	-	-	NOISE
		258	227	235	241	246	249	252	254	256	258	260	-	-	-	FS.LOSS
		2	59	32	22	17	15	5	5	5	2	1	-	-	-	P. LOSS
		21	-41	-15	-4	2	5	16	17	17	21	21	-	-	-	S/N.,DB
		95	0	0	7	22	35	84	86	85	95	95	-	-	-	S/N.,PROB.
														97	-T.REL.	
24	17.8	1F-	2F-	2F-	2F-	1F+	1F+	1F+	1F-	1F-	1F-	1F-	-	-	MODE	
		28	127	122	126	134	21	26	34	22	28	-	-	-	-	ANGLE
		50	99	99	99	94	96	88	70	59	27	-	-	-	-	C.PROB.
		124	126	126	126	127	123	124	124	123	124	-	-	-	-	DELAY
		169	148	154	158	161	163	165	167	169	170	-	-	-	-	NOISE
		257	227	235	241	246	249	252	254	256	258	-	-	-	-	FS.LOSS
		2	59	32	22	17	7	6	5	2	2	-	-	-	-	P. LOSS
		20	-41	-13	-2	2	14	15	16	20	21	-	-	-	-	S/N.,DB
		94	0	1	11	23	76	80	83	93	95	-	-	-	-	S/N.,PROB.
														94	-T.REL.	

11 JUN SSN= 110 26.019
 TRANSMITTER TO 100KM TARGET AZIMUTHS N.MILES
 35.00N - 33.00E 46.00N - 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS ANT= 25DB
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWR=200.00KW 3 MC/S MAN. NOISE = -148 DBW REQ.S/N= 10DB
 OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
2	18.2	1F+	2E+	2F-	1F+	1F+	1F+	1F+	1F+	1F+	1F+	1F+	1F+	1F+	MODE	
		47	48	154	111	24	23	25	30	38	46	46	-	-	ANGLE	
		50	99	99	99	98	94	83	64	35	8	-	-	-	C.PROB.	
		125	121	129	125	123	123	124	124	125	125	-	-	-	DELAY	
		169	148	154	158	161	163	165	167	169	170	171	-	-	NOISE	
		258	226	236	241	245	249	252	254	256	258	260	-	-	FS.LOSS	
		10	309	87	44	25	18	14	11	10	9	8	-	-	P. LOSS	
		12	-291	-68	-24	-3	3	7	10	12	13	14	-	-	S/N..DB	
		66	0	0	0	9	27	41	53	62	69	75	-	-	S/N..PROB.	
													70	=T.REL.		
4	22.3	1F+	2E+	2E+	2F+	2E-	2E-	1F+	MODE							
		42	46	47	50	152	21	25	28	25	28	35	39	39	ANGLE	
		50	99	99	99	99	99	95	89	78	62	45	24	7	C.PROB.	
		125	121	121	121	129	120	120	124	123	124	124	125	125	DELAY	
		172	148	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
		261	226	235	241	246	249	252	254	256	258	260	262	264	266	FS.LOSS
		13	688	322	187	78	45	36	22	18	15	13	12	10	8	P. LOSS
		10	-670	-302	-167	-57	-24	-14	0	4	7	9	11	14	16	S/N..DB
		52	0	0	0	0	0	0	15	28	40	48	60	73	81	S/N..PROB.
													58	=T.REL.		
6	22.7	1F+	-	2E+	2E+	2E+	2E+	2E+	2E-	2E+	1F+	1F+	1F+	1F+	MODE	
		37	-	47	48	50	53	58	22	27	28	30	31	31	31	ANGLE
		50	-	99	99	99	99	99	99	99	80	65	48	27	9	C.PROB.
		124	-	121	121	121	122	122	120	120	124	124	124	124	124	DELAY
		172	-	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
		261	-	235	241	245	248	252	254	256	258	260	262	264	266	FS.LOSS
		17	-	481	279	163	130	49	41	34	22	19	16	13	11	P. LOSS
		6	--	462	-259	-162	-108	-27	-18	-10	1	4	7	10	14	S/N..DB
		36	-	0	0	0	0	0	0	1	18	28	40	51	72	S/N..PROB.
													36	=T.REL.		
8	22.3	1F+	-	2E+	2E+	2E+	2E+	2E+	2E-	2E-	1F+	1F+	1F+	1F+	MODE	
		38	-	46	47	49	51	55	21	23	28	33	29	29	29	ANGLE
		50	-	99	99	99	99	99	99	99	62	44	22	5	C.PROB.	
		124	-	121	121	121	122	122	120	120	124	124	124	124	124	DELAY
		172	-	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
		261	-	235	241	245	248	252	254	256	258	260	262	264	266	FS.LOSS
		20	-	564	327	214	152	75	45	38	25	21	18	15	12	P. LOSS
		3	--	545	-306	-193	-130	-54	-23	-15	-2	1	4	9	12	S/N..DB
		24	-	0	0	0	0	0	0	0	9	19	29	46	61	S/N..PROB.
													24	=T.REL.		

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
10	21.6	1F+	-	2E+	2E+	2E+	2E+	2E+	2E-	2E-	1F+	1F+	1F+	1F+	-	MODE
		45	-	47	48	49	52	56	21	25	40	42	37	37	-	ANGLE
		50	-	99	99	99	99	99	99	73	56	38	17	-	C.PROB.	
		125	-	121	121	121	122	122	120	120	125	125	124	124	-	DELAY
		171	-	154	158	161	163	165	167	169	170	171	172	174	-	NOISE
		261	-	235	241	245	248	252	254	257	258	260	262	264	-	FSLOSS
		20	-	542	314	206	146	52	43	35	24	21	18	15	-	P. LOSS
		3	--	522	293	184	124	-30	-21	-12	-1	2	5	9	-	S/N..DB
		23	-	0	0	0	0	0	0	0	11	22	32	46	-	S/N..PROB.
														20	=T.REL.	
12	20.6	1F+	-	2E+	2E+	2E+	2E+	2E+	2E-	1F+	1F+	1F+	1F+	-	MODE	
		45	-	47	48	51	55	21	25	37	37	39	39	-	ANGLE	
		50	-	99	99	99	99	99	99	86	69	45	22	-	C.PROB.	
		125	-	121	121	122	122	120	120	124	124	125	125	-	DELAY	
		171	-	154	158	161	163	165	167	169	170	171	172	-	NOISE	
		260	-	235	241	245	249	252	254	256	258	260	262	-	FSLOSS	
		17	-	421	244	160	74	43	35	23	20	17	15	-	P. LOSS	
		5	--	401	224	139	-53	-21	-13	-0	3	6	6	-	S/N..DB	
		33	-	0	0	0	0	0	1	14	26	37	45	-	S/N..PROB.	
														28	=T.REL.	
14	20.7	1F+	2E+	2E+	2E+	2F-	2E-	1F+	1F+	1F+	1F+	1F+	1F+	-	MODE	
		39	46	48	51	119	24	26	22	24	30	37	37	-	ANGLE	
		50	99	99	99	99	99	99	95	86	69	46	22	-	C.PROB.	
		125	121	121	122	125	120	124	123	123	124	124	124	-	DELAY	
		171	148	154	157	159	162	165	167	169	170	171	172	-	NOISE	
		260	226	235	241	246	249	252	254	256	258	260	262	-	FSLOSS	
		11	522	245	143	47	37	22	17	14	12	11	10	-	P. LOSS	
		11	-504	-226	-124	-28	-16	-0	4	8	10	12	13	-	S/N..DB	
		58	0	0	0	0	0	12	30	42	52	65	71	-	S/N..PROB.	
														62	=T.REL.	
16	21.3	1F+	2E+	2F-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	1F+	-	MODE	
		38	50	101	89	90	93	98	107	122	26	36	38	-	ANGLE	
		50	99	99	99	99	99	99	91	66	81	55	26	-	C.PROB.	
		124	121	124	123	123	124	124	124	126	124	124	124	-	DELAY	
		171	146	151	154	158	162	165	167	169	170	171	172	-	NOISE	
		260	226	235	241	245	249	252	254	257	258	260	262	-	FSLOSS	
		6	168	42	28	21	16	14	13	12	5	5	5	-	P. LOSS	
		17	-152	-26	-11	-2	3	7	9	10	17	17	18	-	S/N..DB	
		87	0	0	0	8	23	41	48	50	86	87	90	-	S/N..PROB.	
														88	=T.REL.	

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
18	19.9	1F+	2F-	2F-	2F-	2F-	1F+	1F+	1F+	1F+	1F+	1F+	-	-	MODE	
		44	107	97	98	101	106	114	23	29	37	44	44	-	-	ANGLE
		50	99	99	99	99	99	96	98	88	65	33	11	-	-	C.PROB.
		125	125	124	124	124	125	123	124	124	125	125	-	-	-	DELAY
		171	143	149	153	158	163	165	167	169	170	171	172	-	-	NOISE
		259	226	235	241	245	249	252	254	256	258	260	262	-	-	FS.LOSS
		5	49	27	19	15	13	12	5	5	5	5	5	-	-	P. LOSS
		18	-36	-13	-3	2	8	9	17	18	18	18	18	-	-	S/N..DB
		88	0	0	8	22	44	49	86	88	89	89	90	-	-	S/N..PROB.
														97	=T.REL.	
20	18.7	1F+	2F-	2F-	2F-	1F+	-	-	MODE							
		48	113	104	106	110	21	24	29	36	47	47	-	-	-	ANGLE
		50	99	99	99	99	99	97	90	72	44	13	-	-	-	C.PROB.
		125	125	124	124	125	123	123	124	124	125	125	-	-	-	DELAY
		170	143	148	154	159	163	165	167	169	170	171	-	-	-	NOISE
		258	226	235	241	245	249	252	254	256	258	260	-	-	-	FS.LOSS
		6	48	27	19	15	7	6	5	5	5	5	-	-	-	P. LOSS
		17	-35	-13	-2	3	14	15	17	17	17	17	-	-	-	S/N..DB
		85	0	1	9	25	76	80	86	85	86	87	-	-	-	S/N..PROB.
														99	=T.REL.	
22	17.2	1F+	2F-	1F+	-	-	MODE									
		52	129	23	22	23	26	31	37	49	52	-	-	-	-	ANGLE
		50	99	99	99	99	99	94	80	54	18	-	-	-	-	C.PROB.
		126	126	123	123	123	124	124	124	125	126	-	-	-	-	DELAY
		169	148	152	156	161	163	165	167	169	170	-	-	-	-	NOISE
		257	226	235	241	245	249	252	254	257	259	-	-	-	-	FS.LOSS
		6	47	20	12	9	7	6	6	6	6	-	-	-	-	P. LOSS
		16	-29	-3	5	11	13	15	16	16	17	-	-	-	-	S/N..DB
		82	0	10	32	58	71	80	83	81	86	-	-	-	-	S/N..PROB.
														98	=T.REL.	
24	16.1	1F+	2F-	1F+	-	-	-	MODE								
		54	121	24	23	25	29	35	45	54	-	-	-	-	-	ANGLE
		50	99	99	99	99	95	85	64	30	-	-	-	-	-	C.PROB.
		126	126	123	123	123	124	124	125	126	-	-	-	-	-	DELAY
		168	148	154	158	161	163	165	167	169	-	-	-	-	-	NOISE
		256	226	235	241	245	249	252	254	257	-	-	-	-	-	FS.LOSS
		6	47	20	12	9	7	6	6	6	-	-	-	-	-	P. LOSS
		15	-29	-1	7	11	13	15	15	16	-	-	-	-	-	S/N..DB
		78	0	12	39	58	71	80	79	81	-	-	-	-	-	S/N..PROB.
														96	=T.REL.	

16 JUN SSN= 110 26.019
 TRANSMITTER TO 150KM TARGET AZIMUTHS N.MILES
 35.00N - 33.00E 46.00N - 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS ANT= 25DB
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWR=200.00KW 3 MC/S MAN. NOISE = -148 DBW REQ.S/N= 10DB
 OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
2	17.7	1F+	- 2F+	2F-	1F+	1F+	1F+	1F+	1F+	1F+	-	-	-	-	MODE
		56	- 158	105	32	31	34	40	50	55	-	-	-	-	ANGLE
		50	- 99	99	99	98	92	79	58	24	-	-	-	-	C.PROB.
		126	- 129	124	124	124	124	125	125	126	-	-	-	-	DELAY
		169	- 154	158	161	163	165	167	169	170	-	-	-	-	NOISE
		257	- 236	241	245	249	252	254	257	259	-	-	-	-	FS.LOSS
		10	- 86	45	25	18	14	12	11	10	-	-	-	-	P. LOSS
		11	- 68	-24	-4	2	7	10	12	13	-	-	-	-	S/N..DB
		59	- 0	0	7	24	41	53	62	69	-	-	-	-	S/N..PROB.
														64	=T.REL.
4	21.6	1F+	-	-	2F+	2F-	2F-	1F+	MODE						
		51	-	-	155	108	98	35	34	38	47	48	48	-	ANGLE
		50	-	-	99	98	95	94	86	73	55	39	19	-	C.PROB.
		125	-	-	129	125	124	124	124	125	125	125	125	-	DELAY
		171	-	-	161	163	165	167	169	170	171	172	174	-	NOISE
		261	-	-	246	249	252	254	256	258	260	262	264	-	FS.LOSS
		14	-	-	77	45	36	23	18	16	14	12	11	-	P. LOSS
		9	-	-	-57	-24	-14	0	4	7	9	10	13	-	S/N..DB
		49	-	-	0	0	0	15	28	40	48	54	68	-	S/N..PROB.
														52	=T.REL.
6	22.0	1F+	-	-	-	2F+	2F-	1F+	MODE						
		47	-	-	-	141	96	43	37	42	41	41	41	41	ANGLE
		50	-	-	-	85	88	88	76	59	42	22	6	6	C.PROB.
		125	-	-	-	128	124	125	124	125	125	125	125	125	DELAY
		172	-	-	-	165	167	169	170	171	172	174	175	175	NOISE
		261	-	-	-	252	254	257	258	260	262	264	266	266	FS.LOSS
		18	-	-	-	67	41	26	22	19	16	14	11	11	P. LOSS
		5	-	-	-	-45	-19	-3	0	4	6	10	13	13	S/N..DB
		30	-	-	-	0	0	7	15	28	36	51	67	67	S/N..PROB.
														31	=T.REL.
8	21.5	1F+	-	-	-	2F+	2F-	2F-	1F+	1F+	1F+	1F+	1F+	1F+	MODE
		48	-	-	-	148	105	96	46	45	39	39	39	-	ANGLE
		50	-	-	-	82	86	70	73	55	37	16	16	-	C.PROB.
		125	-	-	-	128	124	124	125	125	124	124	124	-	DELAY
		171	-	-	-	165	167	169	170	171	172	174	174	-	NOISE
		261	-	-	-	252	254	256	258	260	262	264	264	-	FS.LOSS
		21	-	-	-	74	46	39	25	22	19	15	15	-	P. LOSS
		1	-	-	-	-53	-23	-15	-2	1	4	8	8	-	S/N..DB
		19	-	-	-	0	0	0	9	19	29	42	-	-	S/N..PROB.
														17	=T.REL.

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
10	20.8						- 2F+	2F-	2F-	1F+	1F+	1F+	1F+	1F+	-
	1F+	-	-	-	-	-	- 156	110	113	48	46	46	46	-	MODE
	54	-	-	-	-	-	- 78	80	61	67	49	31	12	-	ANGLE
	50	-	-	-	-	-	- 129	125	125	125	125	125	125	-	C.PROB.
	126	-	-	-	-	-	- 165	167	169	170	171	172	174	-	DELAY
	171	-	-	-	-	-	- 252	254	257	259	260	262	264	-	NOISE
	260	-	-	-	-	-	- 71	44	36	24	21	18	15	-	FS.LOSS
	21	-	-	-	-	-	- -50	-21	-13	-1	2	4	8	-	P. LOSS
	1	-	-	-	-	-	- 0	0	0	11	22	29	42	-	S/N.,DB
	18	-	-	-	-	-	- 0	0	0	11	22	29	42	-	S/N.,PROB.
														15	=T.REL.
12	19.9						- 2F+	2F-	2F-	1F+	1F+	1F+	1F+	-	-
	1F+	-	-	-	-	-	- 136	112	111	45	48	48	48	-	MODE
	54	-	-	-	-	-	- 94	93	79	82	61	36	15	-	ANGLE
	50	-	-	-	-	-	- 129	125	125	125	125	125	125	-	C.PROB.
	126	-	-	-	-	-	- 163	165	167	169	170	171	172	-	DELAY
	171	-	-	-	-	-	- 250	252	254	257	259	260	262	-	NOISE
	259	-	-	-	-	-	- 73	44	36	23	20	17	15	-	FS.LOSS
	19	-	-	-	-	-	- -52	-22	-13	-0	3	5	8	-	P. LOSS
	4	-	-	-	-	-	- 0	0	1	14	26	33	45	-	S/N.,DB
	28	-	-	-	-	-	- 0	0	1	14	26	33	45	-	S/N.,PROB.
														22	=T.REL.
14	20.0						- 2F+	2F-	1F+	1F+	1F+	1F+	1F+	-	-
	1F+	-	-	-	-	-	- 141	96	33	30	34	41	46	-	MODE
	48	-	-	-	-	-	- 99	99	98	94	82	62	37	-	ANGLE
	50	-	-	-	-	-	- 128	124	124	124	124	125	125	-	C.PROB.
	125	-	-	-	-	-	- 159	162	165	167	169	170	171	-	DELAY
	171	-	-	-	-	-	- 246	249	252	254	256	258	260	-	NOISE
	259	-	-	-	-	-	- 65	37	22	18	15	13	11	-	FS.LOSS
	12	-	-	-	-	-	- -46	-17	-0	4	8	10	11	-	P. LOSS
	11	-	-	-	-	-	- 0	0	12	30	42	52	59	-	S/N.,DB
	56	-	-	-	-	-	- 0	0	12	30	42	52	59	-	S/N.,PROB.
														56	=T.REL.
16	20.6						- 2F-	1F+	2F-	2F-	1F+	1F+	1F+	-	-
	1F+	-	-	-	-	-	- 97	22	82	84	21	24	29	-	MODE
	47	-	-	-	-	-	- 99	99	99	99	99	92	73	-	ANGLE
	50	-	-	-	-	-	- 124	123	123	123	123	124	124	-	C.PROB.
	125	-	-	-	-	-	- 151	154	158	162	165	167	169	-	DELAY
	171	-	-	-	-	-	- 235	241	245	249	252	254	256	-	NOISE
	260	-	-	-	-	-	- 43	21	21	16	8	7	6	-	FS.LOSS
	6	-	-	-	-	-	- -27	-3	-2	3	13	15	16	-	P. LOSS
	16	-	-	-	-	-	- 0	6	8	23	71	79	81	-	S/N.,DB
	82	-	-	-	-	-	- 0	6	8	23	71	79	81	-	S/N.,PROB.
														94	=T.REL.

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
18	19.3	1F+	2F-	1F+	MODE										
		52	102	22	21	22	24	27	32	38	50	52	52	52	ANGLE
		50	99	99	99	99	99	99	96	83	55	24	6	-	C.PROB.
		126	124	123	123	123	123	124	124	124	125	126	126	126	DELAY
		170	143	149	153	158	163	165	167	169	170	171	172	-	NOISE
		259	226	235	241	245	249	252	254	256	259	260	262	-	FS.LOSS
		6	49	20	12	9	7	6	5	5	6	5	5	-	P. LOSS
		16	-37	-6	2	8	14	15	16	17	17	17	17	-	S/N..DB
		83	0	4	22	44	81	80	83	85	86	87	87	-	S/N..PROB.
														98	=T.REL.
20	18.1	1F+	2F-	1F+	MODE										
		56	107	26	25	26	29	33	38	47	56	56	56	56	ANGLE
		50	99	99	99	99	99	96	86	65	32	7	-	-	C.PROB.
		126	125	124	123	124	124	124	124	125	126	126	126	126	DELAY
		169	143	148	154	159	163	165	167	169	170	171	-	-	NOISE
		258	226	235	241	245	249	252	254	257	259	260	-	-	FS.LOSS
		6	49	20	13	9	7	6	6	6	6	6	-	-	P. LOSS
		16	-36	-7	3	9	13	15	16	17	16	17	-	-	S/N..DB
		84	0	4	24	47	71	80	83	85	82	87	-	-	S/N..PROB.
														99	=T.REL.
22	16.7	1F+	2F-	1F+	MODE										
		60	114	30	30	31	35	39	47	60	60	60	60	60	ANGLE
		50	99	99	99	99	99	92	74	44	10	-	-	-	C.PROB.
		126	125	124	124	124	125	125	125	126	126	126	126	126	DELAY
		168	148	152	156	161	163	165	167	169	170	-	-	-	NOISE
		256	226	235	241	245	249	252	254	257	259	-	-	-	FS.LOSS
		7	48	20	13	9	7	7	6	7	6	-	-	-	P. LOSS
		15	-30	-3	5	11	13	14	15	16	16	-	-	-	S/N..DB
		80	0	10	32	58	71	76	79	81	82	-	-	-	S/N..PROB.
														97	=T.REL.
24	15.6	1F+	2F-	1F+	MODE										
		62	115	31	31	33	37	44	56	62	-	-	-	-	ANGLE
		50	99	99	99	99	94	81	58	20	-	-	-	-	C.PROB.
		126	125	124	124	124	125	125	126	126	-	-	-	-	DELAY
		168	148	154	158	161	163	165	167	169	-	-	-	-	NOISE
		255	226	235	241	245	249	252	254	257	-	-	-	-	FS.LOSS
		7	48	21	13	9	8	7	7	7	-	-	-	-	P. LOSS
		15	-30	-1	6	11	13	14	14	15	-	-	-	-	S/N..DB
		77	0	12	36	58	71	76	75	77	-	-	-	-	S/N..PROB.
														95	=T.REL.

1 SEP SSN= 110 26.019
 TRANSMITTER TO 0 KM TARGET AZIMUTHS N.MILES
 35.00N - 33.00E 46.00N - 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS ANT= 25DB
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWR=200.00KW 3 MC/S MAN. NOISE = -148 DBW REQ.S/N= 10DB
 OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
2	16.5	1 F	2 F	2 F	2 F	2 F	2 F	2 F	- 1 F	1 F	-	-	-	-	MODE	
		28	122	116	120	128	145	168	- 27	27	-	-	-	-	ANGLE	
		50	99	99	99	97	74	27	- 41	12	-	-	-	-	C.PROB.	
		124	126	126	126	127	128	130	- 124	124	-	-	-	-	DELAY	
		168	148	154	158	161	163	165	- 169	170	-	-	-	-	NOISE	
		256	227	235	241	245	249	253	- 256	258	-	-	-	-	FS.LOSS	
		3	72	39	26	25	17	16	- 3	2	-	-	-	-	P. LOSS	
		19	-55	-20	-5	1	3	4	- 20	20	-	-	-	-	S/N..DB	
		92	0	0	6	20	27	30	- 93	93	-	-	-	-	S/N..PROB.	
														51	=T.REL.	
4	20.7	2 F	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	MODE	
		136	31	32	35	111	100	99	102	108	118	137	137	-	ANGLE	
		50	99	99	99	99	97	92	82	66	46	20	-	-	C.PROB.	
		127	120	121	121	125	124	124	124	125	126	127	127	-	DELAY	
		171	148	154	158	161	163	165	167	169	170	171	172	-	NOISE	
		260	226	235	241	246	249	252	254	257	259	261	262	-	FS.LOSS	
		19	385	180	105	55	42	33	27	23	20	18	17	-	P. LOSS	
		4	-367	-161	-84	-34	-21	-12	-5	-0	2	4	5	-	S/N..DB	
		29	0	0	0	0	0	1	6	14	23	30	34	-	S/N..PROB.	
														27	=T.REL.	
6	23.1	2 F	2 E	2 E	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	MODE	
		132	30	31	32	34	37	41	101	101	106	114	131	134	-	ANGLE
		50	99	99	99	99	99	99	96	91	82	68	51	17	-	C.PROB.
		127	120	120	121	121	121	121	124	124	125	125	127	127	-	DELAY
		172	148	154	158	161	163	165	167	169	170	171	172	174	-	NOISE
		262	226	235	240	245	248	252	254	256	258	260	262	264	-	FS.LOSS
		23	680	317	184	120	85	52	43	35	30	26	23	20	-	P. LOSS
		0	-661	-298	-163	-98	-63	-30	-20	-12	-7	-3	0	3	-	S/N..DB
		16	0	0	0	0	0	0	0	3	8	14	23	-	S/N..PROB.	
														9	=T.REL.	
8	21.6	2 F	- 2 E	2 E	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	MODE	
		129	- 31	32	33	35	38	42	104	109	122	131	131	131	-	ANGLE
		50	- 99	99	99	99	99	99	89	76	56	30	5	-	C.PROB.	
		127	- 120	121	121	121	121	121	125	125	126	127	127	127	-	DELAY
		172	- 154	158	161	163	165	167	169	170	171	172	174	-	NOISE	
		261	- 235	240	245	248	251	254	256	258	260	262	264	-	FS.LOSS	
		28	- 391	226	148	104	77	50	42	35	30	26	23	-	P. LOSS	
		-4	--372	-205	-126	-82	-55	-28	-18	-12	-6	-3	1	-	S/N..DB	
		5	- 0	0	0	0	0	0	0	0	4	8	17	-	S/N..PROB.	
														3	=T.REL.	

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
10	28.0	1 F	2 E	2 E	2 E	2 E	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	-	- MODE
		22	30	31	32	34	36	39	47	125	136	153	153	153	-	- ANGLE
		50	99	99	99	99	99	99	99	83	65	40	15	-	- C.PROB.	
		123	120	120	121	121	121	121	121	126	127	129	129	-	- DELAY	
		175	148	154	158	161	163	165	167	169	170	171	172	-	- NOISE	
		265	226	235	240	245	248	252	254	257	259	261	262	-	- FS.LOSS	
		9	800	372	215	140	99	56	46	38	32	28	25	-	- P. LOSS	
		15	-782	-353	-194	-119	-77	-35	-24	-15	-9	-5	-2	-	- S/N..DB	
		77	0	0	0	0	0	0	0	1	5	9	-	-	- S/N..PROB.	
														39	- T.REL.	
12	20.4	2 F	2 E	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	-	- MODE
		146	31	31	33	36	116	111	112	118	129	148	148	-	- ANGLE	
		50	99	99	99	99	99	99	96	86	67	38	9	-	- C.PROB.	
		128	120	121	121	121	126	125	125	126	127	128	128	-	- DELAY	
		171	148	154	158	161	163	165	167	169	170	171	172	-	- NOISE	
		260	226	235	240	245	249	252	254	257	259	261	262	-	- FS.LOSS	
		23	571	266	154	101	56	44	36	30	26	23	21	-	- P. LOSS	
		-0	-553	-247	-133	-79	-35	-23	-14	-7	-3	0	2	-	- S/N..DB	
		15	0	0	0	0	0	0	4	9	15	24	-	-	- S/N..PROB.	
														8	- T.REL.	
14	19.9	2 F	2 E	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	-	- MODE	
		141	32	35	102	96	97	100	105	113	128	142	-	-	- ANGLE	
		50	99	99	99	99	99	99	94	83	62	28	-	-	- C.PROB.	
		128	121	121	124	124	124	124	125	125	126	128	-	-	- DELAY	
		171	148	154	158	161	163	165	167	169	170	171	-	-	- NOISE	
		260	226	235	241	245	249	252	254	257	259	261	-	-	- FS.LOSS	
		16	253	118	57	40	30	24	20	18	16	15	-	-	- P. LOSS	
		7	-235	-99	-37	-19	-9	-3	1	4	6	7	-	-	- S/N..DB	
		38	0	0	0	0	3	10	20	28	36	41	-	-	- S/N..PROB.	
														39	- T.REL.	
16	16.6	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	-	- MODE	
		152	110	101	102	105	110	117	129	153	153	-	-	-	- ANGLE	
		50	99	99	99	99	99	94	76	42	10	-	-	-	- C.PROB.	
		129	125	124	124	125	125	126	127	129	129	-	-	-	- DELAY	
		168	148	153	157	161	163	165	167	169	170	-	-	-	- NOISE	
		257	226	235	241	245	249	252	255	257	259	-	-	-	- FS.LOSS	
		13	62	33	22	17	14	13	12	13	12	-	-	-	- P. LOSS	
		8	-44	-15	-3	3	6	8	9	9	10	-	-	-	- S/N..DB	
		45	0	0	8	26	37	45	48	46	52	-	-	-	- S/N..PROB.	
														78	- T.REL.	

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
18	18.5	1 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	- 1 F	1 F	-	-	-	MODE
		28	123	117	119	125	135	155	168	-	27	27	-	-	ANGLE
		50	99	99	99	99	91	61	16	-	39	10	-	-	C.PROB.
		124	126	126	126	127	129	130	-	124	124	-	-	-	DELAY
		170	146	151	156	161	163	165	167	-	170	171	-	-	NOISE
		258	227	235	241	246	249	252	255	-	258	260	-	-	FS.LOSS
		2	59	32	22	17	15	14	14	-	2	1	-	-	P. LOSS
		21	-44	-16	-4	2	5	6	7	-	21	21	-	-	S/N..DB
		94	0	0	8	25	35	39	41	-	95	95	-	-	S/N..PROB.
													58	-	T.REL.
20	16.5	1 F	2 F	2 F	2 F	2 F	2 F	2 F	1 F	1 F	1 F	-	-	-	MODE
		34	132	127	132	140	158	179	23	33	33	-	-	-	ANGLE
		50	99	99	99	94	69	24	71	40	10	-	-	-	C.PROB.
		124	127	126	127	128	129	131	123	124	124	-	-	-	DELAY
		168	146	152	157	161	163	165	167	169	170	-	-	-	NOISE
		256	227	235	241	246	250	253	254	256	258	-	-	-	FS.LOSS
		2	58	32	22	17	16	15	3	2	2	-	-	-	P. LOSS
		19	-42	-15	-3	2	4	5	19	20	21	-	-	-	S/N..DB
		92	0	0	10	25	32	35	92	93	95	-	-	-	S/N..PROB.
													77	-	T.REL.
22	16.2	1 F	2 F	2 F	2 F	2 F	2 F	1 F	1 F	1 F	1 F	-	-	-	MODE
		38	137	134	139	149	169	20	29	38	38	-	-	-	ANGLE
		50	99	99	99	92	64	89	68	34	7	-	-	-	C.PROB.
		124	127	127	127	128	130	123	124	124	124	-	-	-	DELAY
		168	148	154	158	161	163	165	167	169	170	-	-	-	NOISE
		256	227	236	241	246	250	252	254	256	258	-	-	-	FS.LOSS
		2	57	31	22	18	16	4	3	2	2	-	-	-	P. LOSS
		20	-39	-12	-2	2	4	17	19	20	21	-	-	-	S/N..DB
		94	0	1	13	25	32	87	92	93	95	-	-	-	S/N..PROB.
													95	-	T.REL.
24	15.1	1 F	2 F	2 F	2 F	2 F	2 F	1 F	1 F	1 F	1 F	-	-	-	MODE
		41	140	138	144	157	192	26	40	40	40	-	-	-	ANGLE
		50	99	99	99	80	45	84	52	16	-	-	-	-	C.PROB.
		125	128	127	128	129	133	124	125	125	125	-	-	-	DELAY
		167	148	154	158	161	163	165	167	169	-	-	-	-	NOISE
		254	227	236	242	246	250	252	254	256	-	-	-	-	FS.LOSS
		3	56	31	22	18	16	4	3	2	-	-	-	-	P. LOSS
		19	-39	-12	-2	2	3	17	19	20	-	-	-	-	S/N..DB
		92	0	1	11	23	27	87	92	93	-	-	-	-	S/N..PROB.
													90	-	T.REL.

6 SEP SSN= 110 26.019
 TRANSMITTER TO 50 KM TARGET AZIMUTHS N.MILES
 35.00N - 33.00E 46.00N - 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS ANT= 25DB
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWR=200.00KW 3 MC/S MAN. OISE = -148 DBW REQ.S/N= 10DB
 OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
2	16.0	1F+	2F-	2F-	2F+	2F-	1F+	1F+	1F+	1F+	-	-	-	-	MODE
		36	116	109	112	120	134	160	29	36	36	-	-	-	ANGLE
		50	99	99	99	97	79	35	67	30	6	-	-	-	C.PROB.
		124	125	125	125	126	127	129	124	124	124	-	-	-	DELAY
		168	143	154	158	161	163	165	167	169	170	-	-	-	NOISE
		255	226	235	241	245	249	252	254	256	258	-	-	-	FS.LOSS
		6	74	39	26	20	16	15	6	6	5	-	-	-	P. LOSS
		16	-56	-20	-6	1	3	5	16	17	17	-	-	-	S/N..DB
		82	0	0	5	20	27	34	83	85	86	-	-	-	S/N..PROB.
												67			*T.REL.
4	26.5	1F+	2E-	2E-	2E-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	MODE
		21	23	24	26	107	93	91	93	98	106	121	128	128	ANGLE
		50	99	99	99	99	99	98	94	85	72	54	29	5	C.PROB.
		123	120	120	120	125	124	124	124	124	125	126	126	126	DELAY
		174	148	154	158	161	163	165	167	169	170	171	172	174	NOISE
		264	226	235	241	245	249	252	254	256	258	260	262	264	FS.LOSS
		7	380	180	106	56	43	34	28	23	20	18	17	15	P. LOSS
		17	-362	-160	-85	-35	-22	-12	-5	-0	2	4	6	8	S/N..DB
		86	0	0	0	0	1	6	14	23	30	37	43		S/N..PROB.
												43			*T.REL.
6	29.8	1F+	2E-	2E-	2E-	2E-	2F-	2E-	2F-	2F-	2F-	2F-	2F-	2F-	MODE
		21	22	23	24	25	28	103	37	93	96	102	114	124	ANGLE
		50	99	99	99	99	99	99	99	93	85	73	57	25	C.PROB.
		123	120	120	120	120	125	121	121	124	124	124	125	126	DELAY
		175	148	154	158	161	163	165	167	169	170	171	172	174	NOISE
		266	226	235	241	245	248	252	254	256	258	260	262	264	FS.LOSS
		8	668	313	183	121	86	53	43	36	30	26	23	20	P. LOSS
		15	-650	-294	-162	-99	-64	-31	-21	-13	-7	-3	0	3	S/N..DB
		80	0	0	0	0	0	0	0	3	8	14	23		S/N..PROB.
												40			*T.REL.
8	28.2	1F+	-	2E-	2E-	2E-	2F-	2E-	2E-	2F-	2F-	2F-	2F-	2F-	MODE
		21	-	23	24	25	26	28	32	38	98	107	121	121	ANGLE
		50	-	99	99	99	99	99	99	99	81	63	40	9	C.PROB.
		123	-	120	120	120	120	120	121	121	124	125	126	126	DELAY
		175	-	154	158	161	163	165	167	169	170	171	172	174	NOISE
		265	-	235	241	245	248	252	254	256	258	260	262	264	FS.LOSS
		11	-	386	225	148	106	68	51	43	36	30	26	23	P. LOSS
		13	-	--366	-204	-126	-84	-46	-28	-19	-12	-7	-3	1	S/N..DB
		68	-	0	0	0	0	0	0	0	3	8	17		S/N..PROB.
												34			*T.REL.

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
10	27.1	1F+	2E-	2E-	2E-	2E-	2E-	1F+	2F-	2F-	2F-	1F+	1F+	MODE	
		32	22	23	24	25	27	30	34	25	124	143	144	27	29
		50	99	99	99	99	99	99	98	70	49	21	59	19	C.PROB.
		124	120	120	120	120	120	121	123	126	128	128	124	124	DELAY
		174	148	154	158	161	163	165	167	169	170	171	172	174	175
		264	226	235	241	245	248	252	254	256	259	261	262	264	266
		12	785	367	214	141	100	57	47	24	33	28	25	12	P. LOSS
		12	-767	-348	-193	-119	-78	-36	-25	-1	-9	-5	-2	11	S/N..DB
		65	0	0	0	0	0	0	10	1	5	9	57	77	S/N..PROB.
													50	=T.REL.	
12	26.7	1F+	2E-	2E-	2E-	2E-	2F-	1F+	MODE						
		28	23	23	25	27	112	103	104	108	117	136	139	24	25
		50	99	99	99	99	99	99	97	89	73	50	16	57	C.PROB.
		124	120	120	120	125	125	125	125	126	127	127	127	123	DELAY
		174	148	154	158	161	163	165	167	169	170	171	172	174	175
		264	226	235	241	245	249	252	254	257	259	261	262	264	266
		9	561	264	154	102	57	45	37	30	26	23	21	9	P. LOSS
		14	-543	-244	-133	-80	-36	-24	-14	-7	-3	0	2	15	S/N..DB
		75	0	0	0	0	0	0	0	4	9	15	24	78	S/N..PROB.
													54	=T.REL.	
14	25.6	1F+	2E-	2E-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	1F+	-	MODE
		23	24	27	96	89	89	91	96	103	114	133	133	22	-
		50	99	99	99	99	99	99	96	87	69	41	10	43	C.PROB.
		123	120	120	124	124	124	124	124	125	125	127	127	123	DELAY
		174	148	154	158	161	163	166	167	169	170	171	172	174	NOISE
		263	226	235	241	245	249	252	254	256	259	260	262	264	FSLOSS
		5	251	119	58	41	31	25	20	18	16	15	14	5	P. LOSS
		19	-232	-99	-38	-20	-9	-3	1	5	6	7	8	19	S/N..DB
		90	0	0	0	0	3	10	20	31	36	41	45	91	S/N..PROB.
													57	=T.REL.	
16	21.6	1F+	2F-	2F-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	-	-	-	MODE
		29	105	94	94	97	101	108	118	141	144	24	28	-	ANGLE
		50	99	99	99	99	99	96	81	52	16	57	27	-	C.PROB.
		124	125	124	124	124	125	126	128	128	128	123	124	-	DELAY
		171	148	153	157	161	163	165	167	169	170	171	172	-	NOISE
		260	226	235	241	245	249	252	254	257	259	260	262	-	FSLOSS
		4	63	34	22	17	14	13	12	12	12	3	4	-	P. LOSS
		19	-45	-10	-3	3	6	8	9	10	10	19	19	-	S/N..DB
		92	0	0	8	26	37	45	48	50	52	92	92	-	S/N..PROB.
													74	=T.REL.	

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
18	17.8	1F+	2F-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	1F+	-	-	-	MODE
		36	117	110	112	117	126	142	21	30	36	36	-	-	ANGLE
		50	99	99	99	99	93	67	87	63	27	5	-	-	C.PROB.
		124	126	125	125	126	126	128	123	124	124	124	-	-	DELAY
		169	146	151	156	161	163	165	167	169	170	171	-	-	NOISE
		257	226	235	241	246	249	252	254	256	258	260	-	-	FS.LOSS
		5	60	33	22	17	15	14	5	5	5	4	-	-	P. LOSS
		17	-45	-17	-4	3	5	7	17	18	18	18	-	-	S/N..DB
		87	0	0	8	28	35	42	86	88	89	89	-	-	S/N..PROB.
													88	=T.REL.	
20	17.1	1F-	2F-	2F-	2F-	2F-	1F+	1F+	1F-	1F-	-	-	-	-	MODE
		25	125	120	124	132	147	25	34	24	25	-	-	-	ANGLE
		50	99	99	99	95	74	87	64	52	18	-	-	-	C.PROB.
		123	126	126	127	128	123	124	123	123	123	-	-	-	DELAY
		169	146	152	157	161	163	165	167	169	170	-	-	-	NOISE
		256	227	235	241	246	249	252	254	256	258	-	-	-	FS.LOSS
		2	59	32	22	17	15	6	5	2	2	-	-	-	P. LOSS
		20	-43	-15	-3	2	4	15	16	20	21	-	-	-	S/N..DB
		93	0	0	10	25	32	80	83	93	95	-	-	-	S/N..PROB.
													90	=T.REL.	
22	16.8	1F-	2F-	2F-	2F-	1F+	1F+	1F+	1F-	1F-	-	-	-	-	MODE
		29	131	127	131	140	24	30	40	29	29	-	-	-	ANGLE
		50	99	99	99	94	97	85	61	46	13	-	-	-	C.PROB.
		124	127	126	127	128	123	124	125	124	124	-	-	-	DELAY
		168	148	154	158	161	163	165	167	169	170	-	-	-	NOISE
		256	227	235	241	246	249	252	254	256	258	-	-	-	FS.LOSS
		2	58	32	22	17	7	6	6	2	2	-	-	-	P. LOSS
		19	-41	-13	-2	2	14	15	16	20	21	-	-	-	S/N..DB
		92	0	1	13	25	76	80	83	93	95	-	-	-	S/N..PROB.
													94	=T.REL.	
24	15.6	1F-	2F-	1F+	1F+	1F+	1F+	1F+	1F-	1F-	-	-	-	-	MODE
		32	134	20	20	23	28	36	26	31	-	-	-	-	ANGLE
		50	99	99	99	99	96	78	61	24	-	-	-	-	C.PROB.
		124	127	123	123	123	124	124	124	124	-	-	-	-	DELAY
		168	148	154	158	161	163	165	167	169	-	-	-	-	NOISE
		255	227	235	241	245	249	252	254	256	-	-	-	-	FS.LOSS
		3	57	20	12	9	7	6	3	2	-	-	-	-	P. LOSS
		20	-40	-1	7	11	13	14	19	20	-	-	-	-	S/N..DB
		93	0	12	39	58	71	76	92	93	-	-	-	-	S/N..PROB.
													95	=T.REL.	

11 SEP SSN= 110 26.019
 TRANSMITTER TO 100KM TARGET AZIMUTHS N.MILES
 35.00N - 33.00E 46.00N - 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS ANTH 25DB
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWRS=200.00KW 3 MC/S MAN. NOISE = -148 DBW REQ.S/N= 10DB
 OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
2	15.4	1F+	2F-	2F-	2F-	1F+	1F+	1F+	1F+	1F+	-	-	-	-	MODE	
		45	110	101	104	111	23	29	41	45	-	-	-	-	ANGLE	
		50	99	99	99	98	98	87	88	21	-	-	-	-	C.PROB.	
		125	125	124	124	125	123	124	125	125	-	-	-	-	DELAY	
		167	148	154	158	161	163	165	167	169	-	-	-	-	NOISE	
		255	226	235	241	245	249	252	254	257	-	-	-	-	FS.LOSS	
		7	58	32	21	17	8	7	7	6	-	-	-	-	P. LOSS	
		15	-41	-13	-1	3	13	14	15	16	-	-	-	-	S/N..DB	
		80	0	1	12	26	71	76	79	81	-	-	-	-	S/N..PROB.	
														93	=T.REL.	
4	25.5	1F+	2E+	2E+	2F-	1F+	1F+	MODE								
		30	47	48	52	104	86	83	84	88	95	106	118	28	ANGLE	
		50	99	99	99	99	99	98	95	88	77	60	38	44	C.PROB.	
		124	121	121	122	124	123	123	123	124	124	125	124	124	DELAY	
		174	148	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
		263	226	235	241	245	249	252	254	256	258	260	262	264	266	FS.LOSS
		7	462	218	128	44	35	27	23	19	17	16	15	7	P. LOSS	
		16	-444-198-107	-23	-13	-5	0	3	6	7	8	17	18	18	S/N..DB	
		81	0	0	0	0	1	7	15	25	36	41	45	85	S/N..PROB.	
														60	=T.REL.	
6	28.7	1F+	- 2E+	2E+	2E+	2F+	2F-	2E-	2F-	2F-	2F-	2F-	1F+	1F+	MODE	
		30	- 47	48	51	133	99	25	84	86	91	100	20	28	ANGLE	
		50	- 99	99	99	99	99	99	94	88	78	64	69	37	C.PROB.	
		124	- 121	121	122	127	124	120	123	123	123	124	123	124	DELAY	
		175	- 154	158	161	163	165	167	169	170	171	172	174	175	NOISE	
		266	- 235	241	245	249	252	254	256	258	260	262	264	266	FS.LOSS	
		10	- 381	222	146	71	42	35	29	25	22	19	10	9	P. LOSS	
		14	--361-201-125	-50	-20	-12	-5	-1	1	1	3	13	16	16	S/N..DB	
		74	- 0	0	0	0	0	0	4	11	19	25	68	81	S/N..PROB.	
														69	=T.REL.	
8	27.2	1F+	- 2E+	2E+	2E+	2E+	2E+	2E-	1F+	2F-	2F-	2F-	1F+	1F+	MODE	
		31	- 47	48	50	52	57	22	26	21	94	109	26	27	ANGLE	
		50	- 99	99	99	99	99	99	99	96	70	51	60	21	C.PROB.	
		124	- 121	121	121	122	122	120	120	123	124	125	124	124	DELAY	
		174	- 154	158	161	163	165	167	169	170	171	172	174	175	NOISE	
		265	- 235	241	245	248	252	254	256	258	260	262	264	266	FS.LOSS	
		12	- 469	273	179	127	67	41	34	21	25	22	13	10	P. LOSS	
		11	--450-252-158-106	-46	-18	-11	2	-1	1	1	1	11	14	14	S/N..DB	
		69	- 0	0	0	0	0	0	1	21	11	19	57	72	S/N..PROB.	
														56	=T.REL.	

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
10	26.1														
	1F+	-	2E+	2E+	2E+	2F+	2F-	2E-	2E+	1F+	1F+	1F+	1F+	1F+	MODE
	41	-	47	48	50	151	20	23	29	26	26	29	40	38	ANGLE
	50	-	99	99	99	99	99	99	99	94	87	76	51	12	C.PROB.
	125	-	121	121	122	129	120	120	120	124	124	124	125	124	DELAY
	174	-	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
	264	-	235	241	245	249	252	254	256	258	260	262	264	266	FS.LOSS
	13	-	446	259	170	77	46	38	25	20	17	15	13	11	P. LOSS
	11	--	427	239	149	-56	-24	-15	-1	2	5	8	11	14	S/N..DB
	57	-	0	0	0	0	0	0	10	21	32	44	57	72	S/N..PROB.
															53 =T.REL.
12	25.8														
	1F+	2E+	2E+	2E+	2E+	2F+	2F-	1F+	2F-	2F-	1F+	1F+	1F+	1F+	- MODE
	37	46	47	50	53	107	96	22	99	106	20	25	35	-	- ANGLE
	50	99	99	99	99	99	99	99	92	79	88	76	47	-	C.PROB.
	124	121	121	121	122	125	124	123	124	124	123	123	124	-	DELAY
	174	148	154	158	161	163	165	167	169	170	171	172	174	-	NOISE
	264	226	235	241	245	249	252	254	256	258	260	262	264	-	FS.LOSS
	10	683	320	187	123	45	36	22	25	22	13	11	10	-	P. LOSS
	14	-665	-301	-166	-101	-24	-15	0	-2	1	10	12	14	-	S/N..DB
	73	0	0	0	0	0	0	18	10	20	53	65	73	-	S/N..PROB.
															59 =T.REL.
14	24.7														
	1F+	2E+	2E+	2F-	2F-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	1F+	- MODE
	32	48	53	91	81	81	83	87	93	102	120	24	31	-	- ANGLE
	50	99	99	99	99	99	99	97	90	75	53	67	29	-	C.PROB.
	124	121	122	123	123	123	123	123	124	124	125	123	124	-	DELAY
	173	148	154	158	161	163	165	167	169	170	171	172	174	-	NOISE
	263	226	235	241	245	249	252	254	256	258	260	262	264	-	FS.LOSS
	6	304	143	46	33	25	20	17	15	14	13	6	6	-	P. LOSS
	17	-286	-124	-26	-12	-3	1	5	8	9	9	17	18	-	S/N..DB
	87	0	0	0	1	10	21	33	42	47	48	87	88	-	S/N..PROB.
															75 =T.REL.
16	20.8														
	1F+	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	1F+	1F+	- MODE
	37	100	86	86	89	93	98	107	124	27	36	36	-	-	- ANGLE
	50	99	99	99	99	99	97	86	60	73	47	17	-	-	C.PROB.
	124	124	123	123	123	123	124	125	126	124	124	124	-	-	DELAY
	171	148	153	157	161	163	165	167	169	170	171	172	-	-	NOISE
	260	226	235	241	245	249	252	254	257	258	260	262	-	-	FS.LOSS
	4	50	27	18	14	12	11	11	11	4	4	4	-	-	P. LOSS
	18	-32	-9	0	6	8	10	11	11	19	18	19	-	-	S/N..DB
	89	0	2	16	36	45	54	59	56	91	89	92	-	-	S/N..PROB.
															88 =T.REL.

		OPERATING FREQUENCIES														
GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
18	17.2	1F+	2F-	2F-	2F-	1F+	1F+	1F+	1F+	1F+	1F+	-	-	-	-	MODE
		45	111	102	104	109	20	25	31	43	44	-	-	-	-	ANGLE
		50	99	99	99	99	99	96	82	54	17	-	-	-	-	C.PROB.
		125	125	124	124	125	123	123	124	125	125	-	-	-	-	DELAY
		169	146	151	156	161	163	165	167	169	170	-	-	-	-	NOISE
		257	226	235	241	245	249	252	254	257	258	-	-	-	-	FS.LOSS
		6	48	27	19	15	7	6	5	5	5	-	-	-	-	P. LOSS
		17	-32	-11	0	5	14	15	16	17	17	-	-	-	-	S/N.,DB
		85	0	2	16	34	76	80	83	85	86	-	-	-	-	S/N.,PROB.
												99	-	-	-	T.REL.
20	15.4	1F+	2F-	1F+	-	-	-	-	MODE							
		51	119	23	22	24	28	34	46	50	-	-	-	-	-	ANGLE
		50	99	99	99	99	96	83	87	19	-	-	-	-	-	C.PROB.
		125	125	123	123	123	124	124	125	125	-	-	-	-	-	DELAY
		167	146	152	157	161	163	165	167	169	-	-	-	-	-	NOISE
		255	226	235	241	245	249	252	254	257	-	-	-	-	-	FS.LOSS
		6	47	20	12	9	7	6	6	6	-	-	-	-	-	P. LOSS
		15	-31	-3	6	11	13	15	15	16	-	-	-	-	-	S/N.,DB
		80	0	9	38	58	71	80	79	81	-	-	-	-	-	S/N.,PROB.
												96	-	-	-	T.REL.
22	17.4	1F-	2F-	1F+	1F-	-	-	-	-	MODE						
		20	125	26	26	28	32	39	52	55	20	-	-	-	-	ANGLE
		50	99	99	99	99	95	81	53	16	22	-	-	-	-	C.PROB.
		118	126	124	124	124	124	125	126	126	118	-	-	-	-	DELAY
		169	148	154	158	161	163	165	167	169	170	-	-	-	-	NOISE
		256	227	235	241	245	249	252	254	257	258	-	-	-	-	FS.LOSS
		1	46	20	13	9	7	7	7	6	1	-	-	-	-	P. LOSS
		22	-29	-1	7	11	13	14	15	16	22	-	-	-	-	S/N.,DB
		96	0	14	40	58	71	76	79	81	96	-	-	-	-	S/N.,PROB.
												96	-	-	-	T.REL.
24	16.2	1F-	2F-	1F+	1F+	1F+	1F+	1F+	1F+	1F-	1F-	-	-	-	-	MODE
		23	127	28	28	31	37	46	57	23	23	-	-	-	-	ANGLE
		50	99	99	99	99	94	72	31	35	8	-	-	-	-	C.PROB.
		119	126	124	124	124	124	125	126	119	119	-	-	-	-	DELAY
		168	148	154	158	161	163	165	167	169	170	-	-	-	-	NOISE
		255	227	235	241	245	249	252	255	256	258	-	-	-	-	FS.LOSS
		1	46	20	13	9	8	7	7	1	1	-	-	-	-	P. LOSS
		21	-28	-1	7	11	13	14	14	22	22	-	-	-	-	S/N.,DB
		95	0	12	39	58	71	76	75	96	96	-	-	-	-	S/N.,PROB.
												94	-	-	-	T.REL.

16 SEP SSN= 110 26.019
 TRANSMITTER TO 150KM TARGET AZIMUTHS N.MILES
 35.00N - 33.00E 46.00N - 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS ANT= 25DB
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWR=200.00KW 3 MC/S MAN. NOISE = -148 DBW REG.S/N= 10DB

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
2	14.9	1F+	2F-	1F+	1F+	1F+	1F+	1F+	1F+	-	-	-	-	-	MODE	
		53	104	24	24	27	31	39	53	53	-	-	-	-	ANGLE	
		50	99	99	99	99	97	82	48	13	-	-	-	-	C.PROB.	
		126	124	123	123	124	124	126	126	-	-	-	-	-	DELAY	
		167	148	154	158	161	163	165	167	169	-	-	-	-	NOISE	
		254	226	235	241	245	249	252	254	257	-	-	-	-	FS.LOSS	
		7	60	25	15	11	8	7	7	7	-	-	-	-	P. LOSS	
		14	-42	-5	4	9	12	13	14	16	-	-	-	-	S/N..DB	
		74	0	6	29	47	66	71	75	81	-	-	-	-	S/N..PROB.	
														93	=T.REL.	
4	24.6	1F+	-	-	1F-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	1F+	1F+	MODE	
		39	-	-	23	96	79	75	76	79	21	25	30	37	37	ANGLE
		50	-	-	0	99	99	99	96	91	88	78	63	34	5	C.PROB.
		124	-	-	0	124	123	122	122	123	123	123	124	124	124	DELAY
		173	-	-	158	161	163	165	167	169	170	171	172	174	175	NOISE
		263	-	-	241	245	249	252	254	256	258	260	262	264	266	FS.LOSS
		8	-	-	97	45	35	28	23	19	11	9	9	8	7	P. LOSS
		15	-	-	-72	-24	-14	-6	0	3	12	13	14	16	18	S/N..DB
		79	-	-	0	0	0	5	15	25	64	70	75	82	88	S/N..PROB.
														81	=T.REL.	
6	27.8	1F+	-	-	-	2F+	2F-	2F-	1F+	1F+	1F+	1F+	1F+	1F+	MODE	
		40	-	-	-	138	93	80	26	21	21	24	32	37	ANGLE	
		50	-	-	-	99	99	98	98	95	89	81	63	27	C.PROB.	
		125	-	-	-	127	124	123	124	123	123	123	124	124	124	DELAY
		175	-	-	-	163	165	167	169	170	171	172	174	175	175	NOISE
		265	-	-	-	249	252	254	256	258	260	262	264	266	266	FS.LOSS
		11	-	-	-	70	42	35	21	17	15	13	11	9	9	P. LOSS
		14	-	-	-	-49	-21	-13	1	5	8	10	13	15	15	S/N..DB
		72	-	-	-	0	0	0	17	31	44	54	68	77	77	S/N..PROB.
														70	=T.REL.	
8	26.3	1F+	-	-	-	-	2F+	2F-	2F-	1F+	1F+	1F+	1F+	1F+	MODE	
		41	-	-	-	-	133	91	80	29	26	28	39	37	ANGLE	
		50	-	-	-	-	98	99	96	95	88	77	53	13	C.PROB.	
		125	-	-	-	-	127	123	123	124	124	124	125	124	124	DELAY
		174	-	-	-	-	165	167	169	170	171	172	174	175	175	NOISE
		264	-	-	-	-	252	254	256	258	260	262	264	266	266	FS.LOSS
		13	-	-	-	-	67	41	35	21	18	16	13	11	11	P. LOSS
		10	-	-	-	-	-45	-18	-11	1	5	7	10	14	14	S/N..DB
		52	-	-	-	-	0	0	1	18	32	40	51	72	72	S/N..PROB.
														49	=T.REL.	

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
10	25.3				-	2F+	2F-	2F-	1F+	1F+	1F+	1F+	1F+	1F+	MODE	
	50	-	-	-	-	153	111	99	41	34	35	40	47	47	ANGLE	
	50	-	-	-	-	99	99	97	97	93	84	70	41	7	C.PROB.	
	125	-	-	-	-	129	125	124	125	124	124	125	125	125	DELAY	
	173	-	-	-	-	163	165	167	169	170	171	172	174	175	NOISE	
	263	-	-	-	-	249	252	254	256	258	260	262	264	266	FS.LOSS	
	14	-	-	-	-	77	46	38	25	21	18	15	13	11	P. LOSS	
	9	-	-	-	-	-56	-24	-16	-1	2	5	7	10	13	S/N..DB	
	49	-	-	-	-	0	0	0	10	21	32	40	51	67	S/N..PROB.	
														45	*T.REL.	
12	24.9				-	2F+	2F-	2F-	1F+	1F+	1F+	1F+	1F+	1F+	MODE	
	46	-	-	-	-	151	103	89	29	26	27	30	36	43	ANGLE	
	50	-	-	-	-	99	99	99	99	98	94	84	69	33	C.PROB.	
	125	-	-	-	-	129	124	123	124	124	124	124	124	125	DELAY	
	173	-	-	-	-	161	163	165	167	169	170	171	172	174	NOISE	
	263	-	-	-	-	246	249	252	254	256	258	260	262	264	FS.LOSS	
	11	-	-	-	-	78	46	37	22	18	15	13	12	10	P. LOSS	
	12	-	-	-	-	-57	-24	-15	0	4	7	9	11	13	S/N..DB	
	65	-	-	-	-	0	0	0	15	28	40	48	60	68	S/N..PROB.	
														64	*T.REL.	
14	23.9				-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	1F+	MODE	
	41	-	-	-	-	86	74	73	74	77	83	22	28	36	40	ANGLE
	50	-	-	-	-	99	99	99	99	98	93	90	78	59	17	C.PROB.
	125	-	-	-	-	123	122	122	122	123	123	123	124	124	125	DELAY
	173	-	-	-	-	158	161	163	165	167	169	170	171	172	174	NOISE
	262	-	-	-	-	241	245	249	252	254	256	258	260	262	264	FS.LOSS
	7	-	-	-	-	47	33	25	20	17	15	8	7	7	6	P. LOSS
	16	-	-	-	-	-26	-12	-4	1	5	8	15	16	16	17	S/N..DB
	82	-	-	-	-	0	1	8	21	33	42	78	83	84	85	S/N..PROB.
														91	*T.REL.	
16	20.1				-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	1F+	MODE	
	45	95	79	78	81	84	20	24	29	38	45	45	-	-	ANGLE	
	50	99	99	99	99	99	99	96	86	65	34	9	-	-	C.PROB.	
	125	124	123	123	123	123	123	124	124	124	125	125	-	-	DELAY	
	171	148	153	157	161	163	165	167	169	170	171	172	-	-	NOISE	
	269	226	235	241	245	249	252	254	256	258	260	262	-	-	FS.LOSS	
	5	50	28	18	14	12	5	5	5	5	5	5	-	-	P. LOSS	
	18	-33	-9	0	6	9	16	17	18	18	17	18	-	-	S/N..DB	
	88	0	2	16	36	49	84	86	88	89	87	90	-	-	S/N..PROB.	
														99	*T.REL.	

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
18	16.7	1F+	2F-	1F+	-	-	-	MODE							
		53	105	25	24	26	29	33	41	53	53	-	-	-	ANGLE
		50	99	99	99	99	99	94	76	42	10	-	-	-	C.PROB.
		126	124	123	123	124	124	124	125	126	126	-	-	-	DELAY
		168	146	151	156	161	163	165	167	169	170	-	-	-	NOISE
		256	226	235	241	245	249	252	254	257	259	-	-	-	FS.LOSS
		6	49	20	12	9	7	6	6	6	6	-	-	-	P. LOSS
		15	-33	-4	5	11	13	15	16	16	16	-	-	-	S/N.,DB
		80	0	8	34	58	71	80	83	81	82	-	-	-	S/N.,PROB.
														98	=T.REL.
20	15.0	1F+	2F-	1F+	-	-	-	MODE							
		59	113	30	30	32	37	44	59	59	59	-	-	-	ANGLE
		50	99	99	99	99	95	79	49	12	-	-	-	-	C.PROB.
		126	125	124	124	124	124	125	126	126	126	-	-	-	DELAY
		167	146	152	157	161	163	165	167	169	-	-	-	-	NOISE
		254	226	235	241	245	249	252	255	257	-	-	-	-	FS.LOSS
		7	48	20	13	9	8	7	7	7	7	-	-	-	P. LOSS
		14	-32	-3	6	11	13	14	14	14	16	-	-	-	S/N.,DB
		74	0	9	38	58	71	76	75	81	-	-	-	-	S/N.,PROB.
														95	=T.REL.
22	14.7	1F+	2F-	1F+	-	-	-	MODE							
		63	119	34	33	36	41	49	63	63	63	-	-	-	ANGLE
		50	99	99	99	99	94	76	44	9	-	-	-	-	C.PROB.
		127	125	124	124	124	125	125	127	127	127	-	-	-	DELAY
		167	148	154	158	161	163	165	167	169	-	-	-	-	NOISE
		254	226	235	241	245	249	252	255	257	-	-	-	-	FS.LOSS
		7	47	21	13	10	8	7	7	7	7	-	-	-	P. LOSS
		14	-30	-1	6	10	12	14	14	14	15	-	-	-	S/N.,DB
		74	0	14	37	52	66	76	75	77	-	-	-	-	S/N.,PROB.
														93	=T.REL.
24	13.7	1F+	2F-	1F+	-	-	-	MODE							
		66	121	35	36	39	45	57	65	-	-	-	-	-	ANGLE
		50	99	99	99	99	92	64	23	-	-	-	-	-	C.PROB.
		127	126	124	124	125	125	126	127	-	-	-	-	-	DELAY
		166	148	154	158	161	163	165	167	-	-	-	-	-	NOISE
		253	226	235	241	245	249	252	255	-	-	-	-	-	FS.LOSS
		8	47	21	13	10	8	8	7	-	-	-	-	-	P. LOSS
		13	-29	-1	6	10	12	13	14	-	-	-	-	-	S/N.,DB
		69	0	12	36	52	66	71	75	-	-	-	-	-	S/N.,PROB.
														91	=T.REL.

1 DEC SSN= 110 26.019
 TRANSMITTER TO 0 KM TARGET AZIMUTHS N.MILES
 35.00N - 33.00E 46.00N - 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWR=200.00KW 3 MC/S MAN. NOISE = -148 DBW REQ.S/N= 10DB
 OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
2	11.3	1 F	2 F	2 F	2 F	2 F	1 F	1 F	-	-	-	-	-	-	MODE
		28	126	125	140	169	25	28	-	-	-	-	-	-	ANGLE
		50	99	99	84	20	56	8	-	-	-	-	-	-	C.PROB.
		124	126	126	128	130	123	124	-	-	-	-	-	-	DELAY
		164	148	154	158	161	163	165	-	-	-	-	-	-	NOISE
		249	227	235	241	246	249	252	-	-	-	-	-	-	FS.LOSS
		5	58	32	22	18	5	4	-	-	-	-	-	-	P. LOSS
		17	-41	-13	-2	1	16	17	-	-	-	-	-	-	S/N..DB
		85	0	1	11	20	84	87	-	-	-	-	-	-	S/N..PROB.
														57	=T.REL.
4	13.2	2 F	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	MODE
		141	34	102	99	104	113	135	141	-	-	-	-	-	ANGLE
		50	99	99	99	99	95	57	10	-	-	-	-	-	C.PROB.
		128	121	124	124	125	125	127	128	-	-	-	-	-	DELAY
		166	148	154	158	161	163	165	167	-	-	-	-	-	NOISE
		253	226	235	241	245	249	252	255	-	-	-	-	-	FS.LOSS
		16	115	46	30	22	18	16	14	-	-	-	-	-	P. LOSS
		6	-97	-27	-10	-1	2	5	7	-	-	-	-	-	S/N..DB
		35	0	0	2	13	24	34	40	-	-	-	-	-	S/N..PROB.
														47	=T.REL.
6	24.6	2 F	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	MODE
		126	31	32	34	38	95	90	90	92	96	102	111	126	ANGLE
		50	99	99	99	99	99	99	99	99	99	93	74	29	C.PROB.
		126	120	121	121	121	124	124	124	124	124	124	125	126	DELAY
		173	148	154	158	161	163	165	167	169	170	171	172	174	NOISE
		263	226	235	241	245	249	252	254	256	258	260	262	264	FS.LOSS
		15	340	160	93	61	39	31	25	22	19	17	16	15	P. LOSS
		8	-322	-140	-72	-40	-17	-9	-3	1	4	6	7	9	S/N..DB
		44	0	0	0	0	0	2	7	17	27	36	40	46	S/N..PROB.
														53	=T.REL.
8	24.6	2 F	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	MODE
		131	30	31	33	35	112	98	96	97	100	106	116	131	ANGLE
		50	99	99	99	99	99	99	99	99	99	97	80	21	C.PROB.
		127	120	121	121	121	125	124	124	124	124	125	125	127	DELAY
		173	148	154	158	161	163	165	167	169	170	171	172	174	NOISE
		263	226	235	240	245	249	252	254	256	258	260	262	264	FS.LOSS
		18	470	220	128	84	49	39	32	27	23	21	19	17	P. LOSS
		5	-452	-200	-107	-62	-27	-17	-10	-3	-0	2	4	7	S/N..DB
		32	0	0	0	0	0	0	1	7	13	22	29	38	S/N..PROB.
														34	=T.REL.

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
10	22.9	2 F	2 E	2 E	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	-	MODE
		134	31	32	34	37	102	97	97	100	106	115	135	-	ANGLE
		50	99	99	99	99	99	99	99	99	86	49	-	C.PROB.	
		127	120	121	121	121	124	124	124	124	125	125	127	-	DELAY
		172	148	154	158	161	163	165	167	169	170	171	172	-	NOISE
		262	226	235	241	245	249	252	254	256	258	260	262	-	FS.LOSS
		18	437	204	119	78	47	37	30	25	22	20	18	-	P. LOSS
		4	-418	-185	-98	-56	-26	-15	-8	-2	0	3	4	-	S/N..DB
		29	0	0	0	0	0	2	8	15	25	29	-	S/N..PROB.	
													28	=T.REL.	
12	21.4	2 F	2 E	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	-	MODE
		135	32	35	100	91	91	93	97	103	112	128	136	-	ANGLE
		50	99	99	99	99	99	99	99	98	87	58	15	-	C.PROB.
		127	121	121	124	124	124	124	124	125	125	126	127	-	DELAY
		171	148	154	158	161	163	165	167	169	170	171	172	-	NOISE
		261	226	235	241	245	249	252	254	256	258	260	262	-	FS.LOSS
		15	256	120	58	41	31	25	21	18	16	15	14	-	P. LOSS
		7	-237	-100	-38	-20	-10	-3	1	5	6	7	8	-	S/N..DB
		42	0	0	0	0	2	10	20	31	36	41	45	-	S/N..PROB.
													53	=T.REL.	
14	15.6	2 F	2 E	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	2 F	-	MODE
		139	44	91	92	95	101	110	127	139	-	-	-	-	ANGLE
		50	99	99	99	99	99	95	65	10	-	-	-	-	C.PROB.
		127	121	124	124	124	124	125	126	127	-	-	-	-	DELAY
		168	148	154	158	161	163	165	167	169	-	-	-	-	NOISE
		255	226	235	241	245	249	252	255	257	-	-	-	-	FS.LOSS
		13	63	34	22	17	14	13	12	12	-	-	-	-	P. LOSS
		9	-45	-15	-2	3	6	8	9	10	-	-	-	-	S/N..DB
		46	0	0	11	26	37	45	48	50	-	-	-	-	S/N..PROB.
													76	=T.REL.	
16	10.1	2 F	2 F	2 F	2 F	2 F	2 F	-	-	-	-	-	-	-	MODE
		149	112	105	111	126	149	-	-	-	-	-	-	-	ANGLE
		50	99	99	99	87	22	-	-	-	-	-	-	-	C.PROB.
		128	125	125	125	126	128	-	-	-	-	-	-	-	DELAY
		162	148	154	158	161	163	-	-	-	-	-	-	-	NOISE
		248	226	235	241	246	249	-	-	-	-	-	-	-	FS.LOSS
		16	61	33	22	17	15	-	-	-	-	-	-	-	P. LOSS
		3	-43	-14	-2	2	4	-	-	-	-	-	-	-	S/N..DB
		27	0	0	11	23	30	-	-	-	-	-	-	-	S/N..PROB.
													34	=T.REL.	

		OPERATING FREQUENCIES														
GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
18	10.7	1 F	2 F	2 F	2 F	2 F	1 F	-	-	-	-	-	-	-	MODE	
		27	126	126	144	167	26	-	-	-	-	-	-	-	ANGLE	
		50	99	99	85	8	39	-	-	-	-	-	-	-	C.PROB.	
		124	126	126	128	130	124	-	-	-	-	-	-	-	DELAY	
		163	148	154	158	161	163	-	-	-	-	-	-	-	NOISE	
		248	227	235	242	246	249	-	-	-	-	-	-	-	FS.LOSS	
		5	58	32	22	18	5	-	-	-	-	-	-	-	P. LOSS	
		16	-41	-13	-2	1	16	-	-	-	-	-	-	-	S/N..DB	
		82	0	1	13	22	84	-	-	-	-	-	-	-	S/N..PROB.	
														41	=T.REL.	
20	11.0	1 F	2 F	2 F	2 F	2 F	1 F	1 F	-	-	-	-	-	-	MODE	
		34	135	136	154	180	34	34	-	-	-	-	-	-	ANGLE	
		50	99	99	86	13	50	6	-	-	-	-	-	-	C.PROB.	
		124	127	127	129	132	124	124	-	-	-	-	-	-	DELAY	
		163	148	154	158	161	163	165	-	-	-	-	-	-	NOISE	
		249	227	236	242	246	249	252	-	-	-	-	-	-	FS.LOSS	
		5	57	31	22	18	5	3	-	-	-	-	-	-	P. LOSS	
		16	-40	-12	-2	1	16	17	-	-	-	-	-	-	S/N..DB	
		84	0	2	13	22	84	87	-	-	-	-	-	-	S/N..PROB.	
														52	=T.REL.	
22	12.0	1 F	2 F	2 F	2 F	2 F	1 F	1 F	-	-	-	-	-	-	MODE	
		35	135	134	147	181	26	34	-	-	-	-	-	-	ANGLE	
		50	99	99	96	37	77	23	-	-	-	-	-	-	C.PROB.	
		124	127	127	128	132	124	124	-	-	-	-	-	-	DELAY	
		164	148	154	158	161	163	165	-	-	-	-	-	-	NOISE	
		250	227	236	242	246	249	252	-	-	-	-	-	-	FS.LOSS	
		4	57	31	22	18	5	3	-	-	-	-	-	-	P. LOSS	
		17	-40	-12	-2	1	16	17	-	-	-	-	-	-	S/N..DB	
		87	0	2	13	22	84	87	-	-	-	-	-	-	S/N..PROB.	
														76	=T.REL.	
24	12.3	1 F	2 F	2 F	2 F	2 F	1 F	1 F	-	-	-	-	-	-	MODE	
		31	130	129	140	175	20	31	-	-	-	-	-	-	ANGLE	
		50	99	99	93	48	76	31	-	-	-	-	-	-	C.PROB.	
		124	127	127	127	131	123	124	-	-	-	-	-	-	DELAY	
		165	148	154	158	161	163	165	-	-	-	-	-	-	NOISE	
		251	227	235	241	246	249	252	-	-	-	-	-	-	FS.LOSS	
		4	58	31	22	18	5	4	-	-	-	-	-	-	P. LOSS	
		17	-40	-13	-2	1	16	17	-	-	-	-	-	-	S/N..DB	
		85	0	1	11	20	84	87	-	-	-	-	-	-	S/N..PROB.	
														77	=T.REL.	

6 DEC SSN= 110 26.019
 TRANSMITTER TO 50 KM TARGET AZIMUTHS N.MILES
 35.00N - 33.00E 46.00N - 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS ANT= 25DB
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWR=200.00KW 3 MC/S MAN. NOISE = -148 DBW REQ.S/N= 10DB
 OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
2	10.9	1F+	2F-	2F-	1F+	1F+	-	-	-	-	-	-	-	-	MODE
		37	120	117	130	22	36	-	-	-	-	-	-	-	ANGLE
		50	99	99	88	88	46	-	-	-	-	-	-	-	C.PROB.
		124	126	126	127	123	124	-	-	-	-	-	-	-	DELAY
		163	148	154	158	161	163	-	-	-	-	-	-	-	NOISE
		249	227	235	241	245	249	-	-	-	-	-	-	-	FS.LOSS
		8	60	32	22	9	8	-	-	-	-	-	-	-	P. LOSS
		13	-42	-13	-2	12	13	-	-	-	-	-	-	-	S/N..DB
		70	0	1	11	63	71	-	-	-	-	-	-	-	S/N..PROB.
														74	*T.REL.
4	16.9	1F+	2E-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	-	-	-	-	MODE
		22	26	95	92	95	103	120	133	22	22	-	-	-	ANGLE
		50	99	99	99	99	97	68	17	48	11	-	-	-	C.PROB.
		123	120	124	124	124	125	126	127	123	123	-	-	-	DELAY
		169	148	154	158	161	163	165	167	169	170	-	-	-	NOISE
		256	226	235	241	245	249	252	255	256	258	-	-	-	FS.LOSS
		5	116	47	30	22	18	15	14	5	4	-	-	-	P. LOSS
		17	-98	-28	-10	-1	3	5	7	18	18	-	-	-	S/N..DB
		85	0	0	2	13	27	34	40	88	89	-	-	-	S/N..PROB.
														58	*T.REL.
6	25.5	2F-	2E-	2E-	2F+	2F-	MODE								
		117	23	24	26	119	90	83	82	84	87	91	99	117	ANGLE
		50	99	99	99	99	99	99	99	99	99	96	83	42	C.PROB.
		126	120	120	126	124	123	123	123	123	123	124	124	126	DELAY
		174	148	154	158	161	163	165	167	169	170	171	172	174	NOISE
		264	226	235	240	246	249	252	254	256	258	260	262	264	FS.LOSS
		14	336	159	94	57	39	31	26	22	19	17	15	14	P. LOSS
		9	-317	-140	-74	-36	-18	-9	-3	1	4	6	7	9	S/N..DB
		45	0	0	0	0	2	7	17	27	36	40	46	-	S/N..PROB.
														57	*T.REL.
8	25.5	2F-	2E-	2E-	2E-	2F-	MODE								
		122	23	23	25	27	108	92	88	88	91	96	103	122	ANGLE
		50	99	99	99	99	99	99	99	99	99	99	89	38	C.PROB.
		126	120	120	120	125	124	124	124	124	124	124	125	126	DELAY
		174	148	154	158	161	163	165	167	169	170	171	172	174	NOISE
		264	226	235	241	245	249	252	254	256	258	260	262	264	FS.LOSS
		17	463	219	128	85	49	40	33	27	23	21	18	17	P. LOSS
		7	-445	-199	-108	-63	-28	-18	-10	-4	-0	2	4	7	S/N..DB
		37	0	0	0	0	0	0	1	5	13	22	29	38	S/N..PROB.
														36	*T.REL.

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
10	23.7	2F-	2E-	2E-	2F+	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	- MODE
		125	23	24	25	124	96	89	89	91	96	103	116	126	- ANGLE
		50	99	99	99	99	99	99	99	99	99	93	65	8	- C.PROB.
		126	120	120	120	126	124	124	124	124	124	125	126	126	- DELAY
		173	148	154	158	161	163	165	167	169	170	171	172	174	- NOISE
		262	226	235	241	246	249	252	254	256	258	260	262	264	- FS.LOSS
		17	430	203	119	67	48	38	31	26	22	20	18	16	- P. LOSS
		6	-412	-183	-99	-47	-26	-16	-8	-2	0	3	5	7	- S/N..DB
		34	0	0	0	0	0	0	2	8	15	25	32	38	- S/N..PROB.
														33	=T.REL.
12	22.1	2F-	2E-	2E-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	- MODE	
		126	24	26	95	84	83	85	88	93	100	112	127	- ANGLE	
		50	99	99	99	99	99	99	99	99	92	69	29	- C.PROB.	
		126	120	120	124	123	123	123	124	124	124	125	126	- DELAY	
		172	148	154	158	161	163	165	167	169	170	171	172	- NOISE	
		261	226	235	241	245	249	252	254	256	258	260	262	- FS.LOSS	
		15	253	120	59	42	31	25	21	18	16	15	14	- P. LOSS	
		8	-235	-101	-39	-21	-10	-3	1	5	7	8	8	- S/N..DB	
		43	0	0	0	0	2	10	20	31	40	44	45	- S/N..PROB.	
														57	=T.REL.
14	19.9	1F+	2E-	2F-	2F-	2F-	2F-	2F-	2F-	- 1F+	-	-	-	-	- MODE
		21	33	83	84	87	92	100	113	130	-	21	-	-	- ANGLE
		50	99	99	99	99	99	97	75	22	-	21	-	-	- C.PROB.
		123	121	123	123	123	124	124	125	127	-	123	-	-	- DELAY
		170	148	154	158	161	163	165	167	169	-	171	-	-	- NOISE
		259	226	235	241	245	249	252	254	257	-	260	-	-	- FS.LOSS
		3	64	35	23	17	14	12	12	12	-	3	-	-	- P. LOSS
		19	-46	-15	-2	3	6	8	10	10	-	20	-	-	- S/N..DB
		92	0	0	11	26	37	45	53	50	-	94	-	-	- S/N..PROB.
														79	=T.REL.
16	13.1	1F+	2F-	2F-	2F-	2F-	2F-	1F+	1F+	-	-	-	-	-	- MODE
		26	106	98	103	115	141	25	26	-	-	-	-	-	- ANGLE
		50	99	99	99	91	31	52	9	-	-	-	-	-	- C.PROB.
		124	125	124	125	125	128	123	124	-	-	-	-	-	- DELAY
		165	148	154	158	161	163	165	167	-	-	-	-	-	- NOISE
		252	226	235	241	246	249	252	254	-	-	-	-	-	- FS.LOSS
		6	62	34	22	17	15	6	5	-	-	-	-	-	- P. LOSS
		15	-45	-14	-2	3	5	15	17	-	-	-	-	-	- S/N..DB
		80	0	0	11	26	34	80	86	-	-	-	-	-	- S/N..PROB.
														60	=T.REL.

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
18	10.3	1F+	2F-	2F-	1F+	1F+	-	-	-	-	-	-	-	-	MODE
		36	120	118	133	23	35	-	-	-	-	-	-	-	ANGLE
		50	99	99	90	89	26	-	-	-	-	-	-	-	C.PROB.
		124	126	126	127	123	124	-	-	-	-	-	-	-	DELAY
		162	148	154	158	161	163	-	-	-	-	-	-	-	NOISE
		248	227	235	241	245	249	-	-	-	-	-	-	-	FS.LOSS
		8	60	32	22	9	7	-	-	-	-	-	-	-	P. LOSS
		12	-42	-13	-2	11	13	-	-	-	-	-	-	-	S/N..DB
		67	0	1	13	58	71	-	-	-	-	-	-	-	S/N..PROB.
														66	=T.REL.
20	11.4	1F-	2F-	2F-	1F+	1F+	1F-	1F-	-	-	-	-	-	-	MODE
		26	128	128	20	28	21	25	-	-	-	-	-	-	ANGLE
		50	99	99	99	92	62	11	-	-	-	-	-	-	C.PROB.
		124	127	126	123	124	123	123	-	-	-	-	-	-	DELAY
		164	148	154	158	161	163	165	-	-	-	-	-	-	NOISE
		249	227	235	241	245	249	252	-	-	-	-	-	-	FS.LOSS
		5	58	32	12	9	5	4	-	-	-	-	-	-	P. LOSS
		17	-41	-13	7	11	16	17	-	-	-	-	-	-	S/N..DB
		85	0	1	40	58	84	87	-	-	-	-	-	-	S/N..PROB.
														87	=T.REL.
22	12.4	1F-	2F-	2F-	1F+	1F+	1F-	1F-	-	-	-	-	-	-	MODE
		26	128	127	138	25	37	26	-	-	-	-	-	-	ANGLE
		50	99	99	97	98	67	34	-	-	-	-	-	-	C.PROB.
		124	127	126	127	123	124	124	-	-	-	-	-	-	DELAY
		165	148	154	158	161	163	165	-	-	-	-	-	-	NOISE
		251	227	235	241	245	249	252	-	-	-	-	-	-	FS.LOSS
		4	58	32	22	9	8	4	-	-	-	-	-	-	P. LOSS
		17	-41	-13	-2	11	13	17	-	-	-	-	-	-	S/N..DB
		85	0	1	13	58	71	87	-	-	-	-	-	-	S/N..PROB.
														81	=T.REL.
24	12.8	1F-	2F-	2F-	1F+	1F+	1F-	1F-	-	-	-	-	-	-	MODE
		23	124	121	131	21	31	22	22	-	-	-	-	-	ANGLE
		50	99	99	95	95	69	44	6	-	-	-	-	-	C.PROB.
		123	126	126	127	123	124	123	123	-	-	-	-	-	DELAY
		165	148	154	158	161	163	165	167	-	-	-	-	-	NOISE
		251	227	235	241	245	249	252	254	-	-	-	-	-	FS.LOSS
		4	59	32	22	9	7	4	3	-	-	-	-	-	P. LOSS
		17	-42	-13	-2	12	13	17	19	-	-	-	-	-	S/N..DB
		86	0	1	11	63	71	87	92	-	-	-	-	-	S/N..PROB.
														82	=T.REL.

11 DEC SSN= 110 26.019
 TRANSMITTER TO 100KM TARGET AZIMUTHS N.MILES
 35.00N - 33.00E 46.00N - 73.00E 57.5 264.3 1917.1
 SIGMA= 1000 SQ. METERS ANT= 25DB
 OFF AZIMUTH 0 DEG. MIN. ANGLE= 2 DEG. OFF AZIMUTH 0 DEG.
 PWR=200.00KW 3 MC/S MAN. NOISE = -148 DBW REQ.S/N= 10DB
 OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
2	10.5	1F+	2F-	1F+	1F+	1F+	-	-	-	-	-	-	-	-	MODE	
		46	114	21	23	31	45	-	-	-	-	-	-	-	ANGLE	
		50	99	99	99	83	33	-	-	-	-	-	-	-	C.PROB.	
		125	125	123	123	124	125	-	-	-	-	-	-	-	DELAY	
		163	148	154	158	161	163	-	-	-	-	-	-	-	NOISE	
		248	226	235	241	245	249	-	-	-	-	-	-	-	FS.LOSS	
		8	47	20	12	9	8	-	-	-	-	-	-	-	P. LOSS	
		12	-30	-1	7	11	12	-	-	-	-	-	-	-	S/N..DB	
		63	0	12	39	58	66	-	-	-	-	-	-	-	S/N..PROB.	
														76	=T.REL.	
4	16.3	1F+	2E+	2F-	2F-	2F-	2F-	1F+	1F+	1F+	-	-	-	-	MODE	
		31	51	89	84	87	94	107	22	30	30	-	-	-	ANGLE	
		50	99	99	99	99	99	78	78	34	5	-	-	-	C.PROB.	
		124	122	123	123	123	124	124	123	124	124	-	-	-	DELAY	
		168	148	154	158	161	163	165	167	169	170	-	-	-	NOISE	
		256	226	235	241	245	249	252	254	256	258	-	-	-	FS.LOSS	
		6	340	38	25	18	15	13	6	6	5	-	-	-	P. LOSS	
		16	-122	-18	-4	2	5	8	16	17	17	-	-	-	S/N..DB	
		83	0	0	7	23	34	45	83	85	86	-	-	-	S/N..PROB.	
														78	=T.REL.	
6	29.7	1F+	2E+	2E+	2F+	2F-	1F+	MODE								
		24	46	48	51	123	84	76	74	75	77	81	87	103	ANGLE	
		50	99	99	99	99	99	99	99	99	99	98	90	57	C.PROB.	
		123	121	121	122	126	123	122	122	122	123	123	123	124	123	DELAY
		175	148	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
		266	226	235	241	245	249	252	254	256	258	260	262	264	266	FS.LOSS
		5	408	193	114	62	31	25	21	18	16	14	13	12	5	P. LOSS
		18	-390	-174	-94	-35	-10	-3	1	5	7	9	10	11	19	S/N..DB
		90	0	0	0	0	1	8	18	30	39	48	54	57	90	S/N..PROB.
														83	=T.REL.	
8	30.2	1F+	2E+	2E+	2E+	2F+	2F-	1F+	MODE							
		28	46	47	49	53	120	86	80	80	82	86	91	109	27	ANGLE
		50	99	99	99	99	99	99	99	99	99	99	95	57	53	C.PROB.
		124	121	121	121	122	126	123	123	123	123	123	123	125	124	DELAY
		176	148	154	158	161	163	165	167	169	170	171	172	174	175	NOISE
		266	226	235	241	245	248	252	254	256	258	260	262	264	266	FS.LOSS
		7	563	265	156	103	46	32	26	22	19	17	16	14	7	P. LOSS
		18	-545	-246	-135	-82	-24	-10	-4	0	3	6	7	9	18	S/N..DB
		88	0	0	0	0	0	1	6	14	24	36	40	46	88	S/N..PROB.
														68	=T.REL.	

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
10	28.3															
	1F+	2E+	2E+	2E+	2F+	2	-	1F+	2F-	2F-	2F-	2F-	2F-	1F+	1F+	MODE
	29	46	48	51	130	91	21	80	82	86	92	101	20	28		ANGLE
	50	99	99	99	99	99	99	99	99	99	97	79	85	19		C.PROB.
	124	121	121	122	127	123	123	123	123	123	123	124	123	124		DELAY
	175	148	154	158	161	163	165	167	169	170	171	172	174	175		NOISE
	265	226	235	241	246	249	252	254	256	258	260	262	264	266		FS.LOSS
	7	523	247	144	67	38	22	25	21	18	16	15	7	7		P. LOSS
	17	-505	-227	-124	-46	-17	0	-2	2	4	6	8	17	18		S/N..DB
	85	0	0	0	0	0	14	9	20	27	36	44	85	88		S/N..PROB.
														86		*T.REL.
12	26.3															
	1F+	2E+	2E+	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	1F+	-	MODE
	29	48	52	90	77	75	76	79	83	89	99	117	27	-	-	ANGLE
	50	99	99	99	99	99	99	99	99	99	95	80	48	54	-	C.PROB.
	124	121	122	123	122	122	122	123	123	123	124	125	124	-	-	DELAY
	174	148	154	158	161	163	165	167	169	170	171	172	174	-	-	NOISE
	264	226	235	241	245	249	252	254	256	258	260	262	264	-	-	FS.LOSS
	6	307	145	47	34	25	20	17	15	13	13	13	5	-	-	P. LOSS
	18	-289	-126	-26	-12	-4	1	5	8	9	10	10	18	-	-	S/N..DB
	89	0	0	0	1	8	21	33	42	47	53	54	88	-	-	S/N..PROB.
														72		*T.REL.
14	19.1															
	1F+	2E-	2F-	2F-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	-	-	-	-	MODE
	30	23	76	76	79	83	90	101	121	28	29	-	-	-	-	ANGLE
	50	99	99	99	99	99	99	84	39	53	8	-	-	-	-	C.PROB.
	124	120	122	122	123	123	123	124	126	124	124	-	-	-	-	DELAY
	170	148	154	158	161	163	165	167	169	170	171	-	-	-	-	NOISE
	258	226	235	241	245	249	252	254	257	258	260	-	-	-	-	FS.LOSS
	4	50	28	18	14	12	11	10	11	4	4	-	-	-	-	P. LOSS
	18	-33	-8	1	6	9	10	11	12	18	19	-	-	-	-	S/N..DB
	89	0	3	20	36	49	54	59	62	89	92	-	-	-	-	S/N..PROB.
														89		*T.REL.
16	12.6															
	1F+	2F-	2F-	2F-	2F-	1F+	1F+	-	-	-	-	-	-	-	-	MODE
	35	101	90	94	105	22	34	-	-	-	-	-	-	-	-	ANGLE
	50	99	99	99	95	89	38	-	-	-	-	-	-	-	-	C.PROB.
	124	124	123	124	124	123	124	-	-	-	-	-	-	-	-	DELAY
	165	148	154	158	161	163	165	-	-	-	-	-	-	-	-	NOISE
	251	226	235	241	245	249	252	-	-	-	-	-	-	-	-	FS.LOSS
	6	49	27	18	15	7	6	-	-	-	-	-	-	-	-	P. LOSS
	15	-31	-8	1	5	14	15	-	-	-	-	-	-	-	-	S/N..DB
	78	0	3	20	32	76	80	-	-	-	-	-	-	-	-	S/N..PROB.
														85		*T.REL.

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30	
18	9.9														
	1F+	2F-	1F+	1F+	1F+	1F+									MODE
	44	113	21	24	33	43									ANGLE
	50	99	99	99	82	16									C.PROB.
	125	125	123	123	124	125									DELAY
	162	148	154	158	161	163									NOISE
	247	226	235	241	245	249									FS.LOSS
	9	47	20	12	9	8									P. LOSS
	11	-30	-1	7	11	12									S/N..DB
	59	0	15	40	58	66									S/N..PROB.
															73 =T.REL.
20	10.3														
	1F+	2F-	1F+	1F+	1F+	1F+									MODE
	51	122	26	29	38	51									ANGLE
	50	99	99	99	87	27									C.PROB.
	126	126	124	124	124	125									DELAY
	162	148	154	158	161	163									NOISE
	248	226	235	241	245	249									FS.LOSS
	9	46	20	13	10	8									P. LOSS
	11	-29	-1	7	10	12									S/N..DB
	61	0	15	40	52	66									S/N..PROB.
															73 =T.REL.
22	11.2														
	1F+	2F-	1F+	1F+	1F+	1F+									MODE
	52	122	25	27	34	49	51								ANGLE
	50	99	99	99	96	56	8								C.PROB.
	126	126	123	124	124	125	126								DELAY
	164	148	154	158	161	163	165								NOISE
	249	226	235	241	245	249	252								FS.LOSS
	8	46	20	13	9	8	7								P. LOSS
	13	-29	-1	7	11	12	13								S/N..DB
	67	0	15	40	58	66	71								S/N..PROB.
															84 =T.REL.
24	11.5														
	1F+	2F-	1F+	1F+	1F+	1F+	1F+								MODE
	48	118	23	24	30	42	48								ANGLE
	50	99	99	99	93	61	11								C.PROB.
	125	125	123	123	124	125	125								DELAY
	164	148	154	158	161	163	165								NOISE
	250	226	235	241	245	249	252								FS.LOSS
	8	47	20	12	9	8	7								P. LOSS
	13	-29	-1	7	11	12	14								S/N..DB
	68	0	12	39	58	66	76								S/N..PROB.
															84 =T.REL.

16		DEC	SSN= 110										26.019				
TRANSMITTER		TO	150KM TARGET										AZIMUTHS	N.MILES			
35.00N - 33.00E			46.00N - 73.00E										57.5 264.3	1917.1			
SIGMA= 1000 SQ. METERS			MIN. ANGLE= 2 DEG.										OFF AZIMUTH	ANT= 25DB			
OFF AZIMUTH 0 DEG.			3 MC/S MAN. NOISE = -148 DBW										Q DEG.	PWR=200.00KW			
PWR=200.00KW			OPERATING FREQUENCIES										REQ.S/N= 10DB				
GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30			
2	10.2	1F+	2F-	1F+	1F+	1F+	1F+	-	-	-	-	-	-	MODE			
		S4	108	28	31	41	53	-	-	-	-	-	-	ANGLE			
			50	99	99	98	78	23	-	-	-	-	-	C.PROB.			
			126	125	124	124	125	126	-	-	-	-	-	DELAY			
			162	148	154	158	161	163	-	-	-	-	-	NOISE			
			248	226	235	241	245	249	-	-	-	-	-	FS.LOSS			
			9	48	20	13	10	9	-	-	-	-	-	P. LOSS			
			11	-31	-1	6	10	12	-	-	-	-	-	S/N..DB			
			60	0	12	36	52	66	-	-	-	-	-	S/N..PROB.			
													67	=T.REL.			
4	15.7	1F+	-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	-	-	-	MODE			
		40	-	82	76	78	84	24	33	39	-	-	-	ANGLE			
			50	-	99	99	99	99	96	68	21	-	-	C.PROB.			
			125	-	123	122	123	123	124	125	-	-	-	DELAY			
			168	-	154	158	161	163	165	167	169	-	-	NOISE			
			255	-	235	241	245	249	252	254	256	-	-	FS.LOSS			
			7	-	38	25	18	15	7	7	6	-	-	P. LOSS			
			15	-	-19	-4	2	6	14	15	16	-	-	S/N..DB			
			77	-	0	7	23	37	76	79	81	-	-	S/N..PROB.			
													93	=T.REL.			
6	28.6	1F+	-	-	2F+	2F-	1F+	2F-	2F-	2F-	2F-	2F-	1F+	1F+	MODE		
		33	-	-	-	126	79	21	66	66	68	71	76	23	32	ANGLE	
			50	-	-	99	99	99	99	99	99	99	95	82	32	C.PROB.	
			124	-	-	126	123	123	122	122	122	122	122	123	124	DELAY	
			175	-	-	161	163	165	167	169	170	171	172	174	175	NOISE	
			265	-	-	246	249	252	254	256	258	260	261	264	266	FS.LOSS	
			6	-	-	56	32	18	21	18	15	14	13	6	6	P. LOSS	
			18	-	-	-35	-10	3	1	5	7	9	10	18	19	S/N..DB	
			89	-	-	-	0	1	25	18	30	39	48	54	88	90	S/N..PROB.
														91	=T.REL.		
8	29.1	1F+	-	-	-	2F+	2F-	1F+	2F-	2F-	2F-	2F-	1F+	1F+	MODE		
		37	-	-	-	-	125	80	24	71	73	76	80	25	35	ANGLE	
			50	-	-	-	99	99	99	99	99	99	98	91	33	C.PROB.	
			124	-	-	-	126	123	123	122	122	122	123	123	124	DELAY	
			175	-	-	-	163	165	167	169	170	171	172	174	175	NOISE	
			266	-	-	-	249	252	254	256	258	260	261	264	266	FS.LOSS	
			8	-	-	-	55	32	19	22	19	17	15	8	7	P. LOSS	
			16	-	-	-	-34	-10	3	0	4	6	8	16	17	S/N..DB	
			83	-	-	-	-	0	1	24	14	27	36	44	82	84	S/N..PROB.
														89	=T.REL.		

OPERATING FREQUENCIES

GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
10	27.3				-	2F+	2F-	1F+	2F-	2F-	2F-	2F-	1F+	1F+	1F+	MODE
	38	-	-	-	134	86	29	72	73	76	81	23	32	37		ANGLE
	50	-	-	-	99	99	99	99	99	99	99	98	73	8		C.PROB.
	124	-	-	-	127	123	124	122	122	122	123	123	124	124		DELAY
	174	-	-	-	161	163	165	167	169	170	171	172	174	175		NOISE
	265	-	-	-	246	249	252	254	256	258	260	262	264	266		FS.LOSS
	8	-	-	-	66	38	22	25	21	18	16	9	8	7		P. LOSS
	15	-	-	-	-45	-17	0	-2	2	5	7	14	16	17		S/N..DB
	80	-	-	-	0	0	14	9	20	31	40	75	82	84		S/N..PROB.
														85	=T.REL.	
12	25.4				-	2F-	1F+	1F+	1F+							
	1F+	-	-	-	2F-	1F+	1F+	1F+	-	MODE						
	37	-	-	-	86	69	67	68	70	74	79	21	27	37	-	ANGLE
	50	-	-	-	99	99	99	99	99	99	98	96	82	37	-	C.PROB.
	124	-	-	-	123	122	122	122	122	122	123	123	124	124	-	DELAY
	173	-	-	-	158	161	163	165	167	169	170	171	172	174	-	NOISE
	263	-	-	-	241	245	249	251	254	256	258	260	262	264	-	FS.LOSS
	6	-	-	-	47	34	26	20	17	15	13	7	6	6	-	P. LOSS
	17	-	-	-	-27	-13	-4	1	5	8	10	16	17	18	-	S/N..DB
	88	-	-	-	0	1	8	21	33	42	52	83	87	88	-	S/N..PROB.
														93	=T.REL.	
14	18.5				1F+	2F+	2F-	2F-	2F-	2F-	1F+	1F+	1F+	-	-	MODE
	1F+	2F+	2F-	2F-	2F-	2F-	2F-	2F-	1F+	1F+	1F+	-	-	-	-	ANGLE
	38	119	68	68	70	74	80	21	29	38	-	-	-	-		C.PROB.
	50	99	99	99	99	99	99	99	97	79	34	-	-	-	-	DELAY
	124	126	122	122	122	122	123	123	124	124	-	-	-	-		NOISE
	170	148	154	158	161	163	165	167	169	170	-	-	-	-		FS.LOSS
	258	226	235	241	245	249	252	254	256	258	-	-	-	-		P. LOSS
	5	51	28	18	14	12	10	5	5	5	-	-	-	-		S/N..DB
	18	-33	-9	1	6	9	11	17	18	18	-	-	-	-		S/N..PROB.
	88	0	2	20	36	49	60	86	88	89	-	-	-	-	95	=T.REL.
16	12.2				1F+	2F-	2F-	1F+	1F+	1F+	-	-	-	-	-	MODE
	1F+	2F-	2F-	2F-	1F+	1F+	1F+	-	-	-	-	-	-	-	-	ANGLE
	43	96	82	86	24	32	43	-	-	-	-	-	-	-	-	C.PROB.
	50	99	99	99	99	83	26	-	-	-	-	-	-	-	-	DELAY
	125	124	123	123	123	124	125	-	-	-	-	-	-	-		NOISE
	165	148	154	158	161	163	165	-	-	-	-	-	-	-		FS.LOSS
	251	226	235	241	245	249	252	-	-	-	-	-	-	-		P. LOSS
	7	50	28	18	9	7	7	-	-	-	-	-	-	-		S/N..DB
	14	-32	-8	1	11	13	14	-	-	-	-	-	-	-		S/N..PROB.
	72	0	3	20	58	71	76	-	-	-	-	-	-	-	87	=T.REL.

UNCLASSIFIED

		OPERATING FREQUENCIES														
GMT	MUF	3	5	7	9	11	13	15	17	19	21	23	26	30		
18	9.6	1F+	2F-	1F+	1F+	1F+	1F+	-	-	-	-	-	-	-	MODE	
		52	108	28	32	44	52	-	-	-	-	-	-	-	ANGLE	
		50	99	99	99	73	9	-	-	-	-	-	-	-	C.PROB.	
		126	125	124	124	125	126	-	-	-	-	-	-	-	DELAY	
		162	148	154	158	161	163	-	-	-	-	-	-	-	NOISE	
		247	226	235	241	245	249	-	-	-	-	-	-	-	FSLOSS	
		10	48	20	13	10	8	-	-	-	-	-	-	-	PLOSS	
		11	-31	-1	6	10	12	-	-	-	-	-	-	-	S/N, DB	
		56	0	15	37	52	66	-	-	-	-	-	-	-	S/N, PROB.	
															64	=T.REL.
20	9.9	1F+	2F-	1F+	1F+	1F+	1F+	-	-	-	-	-	-	-	MODE	
		59	116	34	37	48	59	-	-	-	-	-	-	-	ANGLE	
		50	99	99	99	81	18	-	-	-	-	-	-	-	C.PROB.	
		126	125	124	124	125	126	-	-	-	-	-	-	-	DELAY	
		162	148	154	158	161	163	-	-	-	-	-	-	-	NOISE	
		247	226	235	241	246	249	-	-	-	-	-	-	-	FSLOSS	
		10	47	21	13	10	9	-	-	-	-	-	-	-	PLOSS	
		10	-30	-1	6	10	11	-	-	-	-	-	-	-	S/N, DB	
		53	0	15	37	52	60	-	-	-	-	-	-	-	S/N, PROB.	
															68	=T.REL.
22	10.8	1F+	2F-	1F+	1F+	1F+	1F+	-	-	-	-	-	-	-	MODE	
		60	116	33	35	43	59	-	-	-	-	-	-	-	ANGLE	
		50	99	99	99	94	45	-	-	-	-	-	-	-	C.PROB.	
		126	125	124	124	125	126	-	-	-	-	-	-	-	DELAY	
		163	148	154	158	161	163	-	-	-	-	-	-	-	NOISE	
		249	226	235	241	245	249	-	-	-	-	-	-	-	FSLOSS	
		9	47	21	13	10	9	-	-	-	-	-	-	-	PLOSS	
		11	-30	-1	6	10	11	-	-	-	-	-	-	-	S/N, DB	
		59	0	15	37	52	60	-	-	-	-	-	-	-	S/N, PROB.	
															77	=T.REL.
24	11.1	1F+	2F-	1F+	1F+	1F+	1F+	1F+	-	-	-	-	-	-	MODE	
		57	112	30	32	39	55	56	-	-	-	-	-	-	ANGLE	
		50	99	99	99	90	53	6	-	-	-	-	-	-	C.PROB.	
		126	125	124	124	124	126	126	-	-	-	-	-	-	DELAY	
		163	148	154	158	161	163	165	-	-	-	-	-	-	NOISE	
		249	226	235	241	245	249	252	-	-	-	-	-	-	FSLOSS	
		9	48	20	13	10	9	8	-	-	-	-	-	-	PLOSS	
		11	-30	-1	6	10	11	13	-	-	-	-	-	-	S/N, DB	
		61	0	12	36	52	60	71	-	-	-	-	-	-	S/N, PROB.	
															78	=T.REL.